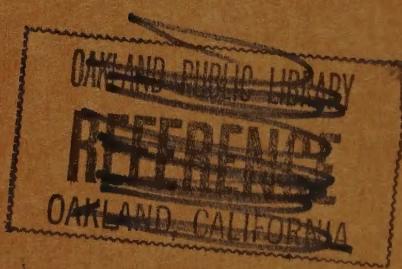


JOURNAL OF

CALENDAR REFORM.

v. 7

1937



APRIL, 1937

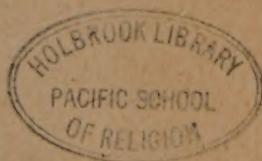


JOURNAL OF CALENDAR REFORM

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New York City



V.T
1937

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THE WORLD CALENDAR

All Years Alike
All Quarters Equal

First Quarter

JANUARY						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
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Second Quarter

APRIL						
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Third Quarter

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Fourth Quarter

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NOVEMBER						
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24	25	26	27	28	29	30

*YEAR-END DAY, December Y, follows December 30th every year

**LEAP-YEAR DAY, June L, follows June 30th in leap years

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a "perpetual" calendar. Every year is the same; every quarter identical.

In this new calendar, each quarter contains exactly three months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Every month has 26 weekdays.

In order to make the calendar perpetual (identical for every year), at the same time retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30th and January 1st and considered an extra Saturday. The 366th day

in leap years, called Leap-Year Day, is intercalated between June 30th and July 1st on another extra Saturday. These intercalary or stabilizing days are tabulated as December Y and June L, and would probably be observed as international holidays. January 1st, New Year's Day, always falls on Sunday.

The revised calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, coordinates the different time-periods, and stabilizes religious and secular holidays. As compared with any other proposal for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made without disturbance.

"Our stability is but balance." —Robert Bridges.

The Representative of Chile, speaking at the meeting of the Council of the League of Nations on January 25, presented the plan which was accepted unanimously by the Council (See Pages 4 to 8). He said:

"Members of the Council are aware of the fact that the Chilean Government is particularly interested in this question. On behalf of my government, I have the honor to lay before the Council a draft convention which I would ask you to consider as a contribution made by my country to the proposed study on calendar reform. I would point out the necessity for the League's continuing this study with some speed. The nearest date for the adoption of the universal calendar is Sunday, January 1, 1939, and in these circumstances it is important that during the present year, governments should be in a position to undertake an examination of a draft convention which the Secretariat should be asked to submit to them. As you will realize, the reform of the present calendar will be useful only if it is applied—if not by all countries—at least by almost all. Hence it is necessary that an international convention should be drawn up and this should be the work of a diplomatic conference."



H. E. DON AUGUSTIN EDWARDS

Chilean Ambassador to Great Britain and Representative of Chile at the 96th Session of the Council of the League of Nations. His Draft Treaty on Calendar Reform is being submitted to all nations by order of the League Council. (See Pages 4 to 8.)

JOURNAL OF CALENDAR REFORM

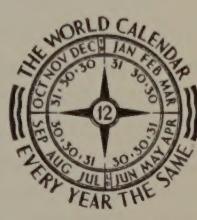
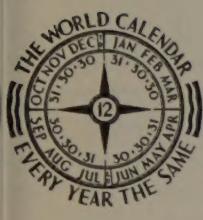
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APRIL, 1937

No. 1

LOOKING AT THE YEAR 1937

By B. F. YANNEY

Professor of Mathematics, Wooster College

LOOKING at the civil calendar for the year 1937, we find that it is precisely the same as it was in the past years 1909, 1915 and 1926. The series of yearly intervals between the years of the set of similar calendars is seen to be 6-11-11. This series of intervals proceeds to the end of the present century, and it will be easy therefore to select the remaining years of the century whose calendars will be repetitions of 1937. Unless, of course, the form of calendar is changed in the meantime.

The year 1937 is what is known as a "common" year, and Friday is the favored weekday marked for the year's beginning and ending.

From the standpoint of fragmentary weeks within the months, this year's calendar is about as bad a specimen as our present system can offer. The weekly make-up of January is one of the worst, with October just like it and May differing from them only in the order of the fragmentary weeks. The main section of each month is made up of four full-sized weeks, and each has a prefix of one day and an annex of two days, or vice versa.

The only other months of this year that have four full-sized weeks are July and August, and they are so joined as to make a stretch of eight consecutive full weeks, the sole instance of the kind in the year's calendar. All the remaining seven months have in the main only three full weeks, pre-

ceded and followed in each case by a part of a week, varying all the way from a one-day to a six-day part.

We thus have in every calendar year eleven varieties of monthly calendar, depending on two things: the number of days in the month, and the day of the week on which it begins. As a matter of fact there are seven varieties of calendar possible for each month, except February. It has fourteen variations.

Fortunately, these differences in the individual months themselves are not independent of each other. If they were wholly so, the number of varieties of yearly calendar would run into the billions. On the contrary, their mutual dependence is such that all these possible varieties of monthly calendar become organized into but fourteen distinct kinds of yearly characteristic calendars. All of these occurred within the first twenty-eight years of the present century, each of the seven kinds of common year type occurring three times, but each of the leap year type only once.

Even this limited variation of calendar has become a matter of both national and international consideration. Much thought and effort have already been given toward a simplification of both monthly and yearly varieties to a minimum, within the range of practicability and common sense. Certainly eleven different monthly calendars would be unthinkable for a yearly set-up, if we had to start an entirely new calendar. Even Julius Caesar had too much common sense to do a thing like that. What he started in the year 45 B.C., barring the incorrect rule for leap year, was a well-nigh perfect calendar for his day and generation. And 19 centuries is a long time to wait to eradicate the mischief that Augustus Caesar did to the Julian calendar, and to readjust the weekly features that were at a later date woven into that calendar.

Within the past few years several nations have definitely announced their readiness to adopt a simplified calendar. They are simply waiting for the League of Nations to proceed along the line of concerted action among all the nations involved.

The World Calendar and the 13-month plan are the leading competitors in the field, the former leading and gaining in favor. As is now pretty well known, The World Calendar consists of twelve months, divided into four equal quarters, each having three months of 31, 30, 30 days, respectively. The odd day, or the 365th day, of a common year will be given a special name, as will also the extra odd day of a leap year. In the latter case one of the extra days will be placed between June and July.

The League of Nations hopes that the necessary steps can be taken for the inauguration of a simplified calendar at the beginning of 1939.

It may be of interest to know what changes would be found in the calendar for 1939 in case The World Calendar were adopted. There would be no change from January 1 to February 28, inclusive. The new February would have two additional days, thus becoming a 30-day month. Then would follow March, shortened by one day, it, too, becoming a 30-day month. This would complete the first quarter. The second quarter would be composed of April, May and June, with the calendar precisely like

that of the first three months. April would have an extra day, May one less day, with no change in the number of days in June. Then would follow the same calendar for July, August, September—August being reduced to a 30-day month.

Strange to say, September would be exactly the same in this calendar that it would be in the Gregorian. The year would end with no change whatever in October, November, or December, except that the last month would no longer have 31 days. What would have been December 31, would still be the very last day of the year, but would have a special name.

This redistribution of days among the months would slightly displace dates from March 1 to August 30, if compared with those corresponding to them in the Gregorian calendar for the same year. In no instance, however, would the displacement be more than one day or two.

In nearly half of the year's calendar there would be no change whatever. It is believed that the transition would cause very little, if any inconvenience. And the possible advantages that would immediately ensue would mark the improvement as one of signal importance to the whole world.

In looking through the calendar for 1937, there are one or two somewhat unusual occurrences to be noted. For instance, there is an annular eclipse of the sun, dated December 2 in our almanacs. The date is given for eastern standard time. In Greenwich time, the eclipse must be dated for the 2nd and 3rd, and it is so listed in the American Nautical Almanac. Moreover, if the dating of this eclipse is made with reference to the civil times of the regions over which it occurs, then we must say that it begins December 3 and ends December 2—believe it or not.

This seeming paradox is explained by the fact that the region over which the eclipse is first visible lies west of the international date-line, where the third day of the month will have already begun.

During the progress of the eclipse this region of visibility will shift over to the east side of the date-line, where it will still be December 2. During the time that the visibility area extends both ways from the date-line, the eclipse may be said to be simultaneously on both dates.

A similar situation will arise also in the case of an eclipse on June 8, but for a slightly different reason. In this case the eclipse will begin east of the international date-line, but, owing to the rotation of the earth, the region of visibility will spread westward until it will be partly across the date-line. Hence during that period of time the eclipse could be said to be on both June 8 and June 9. However, before the phenomenon ends the eclipse will be on the side where it began, and so end on the same date.

NEW GERMAN COMMITTEE MEETS

The German Ministry of the Interior has made public its decision to conduct an energetic and complete study of proposals for calendar reform. The new committee for this purpose held its first meeting in Berlin on February 26, under the presidency of the Ministerial Director R. Reichard, president of the German Economic Office.

Other members of the "Deutscher Ausschuss für Kalenderreform" are: President A. Pietzsch, Leader of the Reich Economic Council; President Abr. Frowein, German Section International Chamber of Commerce; Dr. Haerecke, Director German Section International Chamber of Commerce; Dr. Dierig, Leader of the German Industry Group; Professor Dr. Lüer, Leader of the German Commerce Group; General Councillor Dr. Fischer, Leader of the Reich Bankers; Director Hilgard, Leader of the German Insurance Group; Director Krecke, Leader of the Reich Group of Public Utilities; President Lohmann, Representative of the German Guilds; State Councillor Essberger, Leader of the Marine Transport Group; Professor Dr. Simons, former Chief Justice of the Reich; Dr. Rudolph Blochmann, secretary of the Weltbund for Calendar Reform; Dr. Prion, Professor in the University of Berlin.

CALENDAR REFORM

THE Council of the League of Nations on January 25, 1937, voted to submit the following "draft convention" or treaty on calendar reform to all nations:

The High Contracting Parties,

Considering that it is widely recognized that the present calendar is unsatisfactory in its application to economic, social and religious matters, and that recent studies, investigations and information have shown the existence of a desire to bring about its revision;

Whereas a reform of the calendar, based upon a scheme comprising twelve months and equal quarters, would be extremely convenient for commercial and business life and would enhance the welfare of the working classes, and would be very advantageous for all nations,

Have appointed the following plenipotentiaries to consider a convention to reform the Gregorian calendar:

Who, after having communicated to each other their full powers, found in good and due form, have agreed upon the following provisions:

ARTICLE I.

The High Contracting Parties hereby decide to put into effect, in their respective territories, as from January 1st, 1939, the perpetual calendar of twelve months and equal quarters, known as The World Calendar, which forms an appendix to this Convention.

ARTICLE II.

The present Convention shall be ratified and the ratifications thereof shall be deposited with the Secretariat of the League of Nations not later than December 1st, 1938.

ARTICLE III.

The present Convention shall not come into force in respect of the States which have ratified it unless, on the date mentioned in Article I, the instruments of ratification or accession have been deposited at the Secretariat by three-quarters of the total number of States Members of the League of Nations and of non-member States to which the Council shall have communicated a copy of the present Convention.

ARTICLE IV.

The present Convention shall be open for signature by the States mentioned in Article III until . . . From that date onward, the above-mentioned States may accede to it by depositing their instruments of accession with the Secretary-General of the League of Nations. The Secretary-General of the League of Nations shall notify the above-mentioned States of the ratifications and accessions received.

The treaty was introduced in the League Council on behalf of the Chilean Government by H. E. Don Augustin Edwards, Chilean Ambassador to Great Britain.

LEAGUE ACTION ON CALENDAR

Council of League of Nations Submits Draft Treaty to All Governments for Enactment of Calendar Reform

AT A MEETING of the Council of the League of Nations, on January 25, 1937, it was voted to submit a "draft convention" on calendar reform to all governments. The text of the proposed treaty is printed on the opposite page.

The convention calls for adoption on January 1, 1939, of the new calendar, which is the plan known in the United States as The World Calendar.

The official minutes of the meeting of the Council of the League of Nations are as follows:

NINETY-SIXTH SESSION OF THE COUNCIL

Provisional Minutes of the Third Meeting held Monday, January 25, 1937, at 5 p.m.
President, Mr. Wellington Koo

MEMBERS

Bolivia	Mr. Costa DuRels
United Kingdom of Great Britain and Northern Ireland	Mr. Eden
Chile	Mr. Edwards
China	Mr. Wellington Koo
Ecuador	Mr. Gastelu
France	Mr. Delbos
Italy	
Latvia	M. Munters
New Zealand	Mr. Nash and Mr. Jordan
Poland	M. Komarnicki and Mr. Beck
Roumania	M. Antonesco
Spain	M. Azcarate and M. Alvarez del Vayo
Sweden	M. Sandler
Turkey	M. Rüstü Aras
U.S.S.R.	M. Litvinoff
Secretary-General	M. Avenol

Communication by the Governing Body of the International Labour Office of a resolution adopted by the International Labour Conference. On the invitation of the President, Mr. Butler, Director of the International Labour Office, came to the Council Table.

M. Litvinoff presented the Report (document C. 34.1937. VIII).

M. LITVINOFF: Members of the Council have before them my Report, and also the letter of the Director of the International Labour Office regarding the reform of the calendar. You are aware that this question has been referred to the Advisory and Technical Committee for Communications and Transit, which has duly kept in touch with the efforts made by the circles concerned, to enlighten opinion as to the advantages and drawbacks of a reform. It has thus obtained a large volume of information both on the efforts made by private organizations and the Press to enlighten opinion as to the advantages of reform, and on the interest evinced in the question by certain organs and institutions of an official or semi-official character. On the other hand, the opposition to reform displayed at the time of the Fourth Conference in various quarters has not diminished, judging by communications in this sense which are continually being received by the Secretariat. The information available shows that

the arguments advanced for and against reform at that Conference continue to be invoked.

This being so, I would suggest, in view of the interest displayed by the International Labour Conference in a reform of the calendar, that the Council should recommend the Conference's Resolution to the attention of the Advisory and Technical Committee for Communications and Transit.

M. EDWARDS: Mr. President, the question of calendar reform has for a very long period been the subject of discussions both in official gatherings and in private bodies. As far as the League is concerned, you will recall that the 1931 Conference, five years ago, during which this question was considered in all its extent, was one such occasion. Forty-four States were officially represented at that Conference; but at that time (which was already some time ago) the movement in favour of calendar reform had not developed in the way it has today, and international official bodies had not yet expressed their views. You all have before you the Report by M. Litvinoff and also the communication from the Governing Body of the International Labour Office. I shall not dwell upon the past; I will confine myself to recalling very briefly the chief facts which, during 1936, have shown the progress that has taken place with regard to the idea of reform of the present Gregorian Calendar.

In the first place there is the resolution adopted by the Labour Conference of American States which met at Santiago de Chile on January 14th, 1936. After considering the work done by the Secretary-General of the League and of the International Labour Office in this matter, the Conference recommended the approval of a perpetual calendar—twelve months with equal quarters—and requested the Governing Body of the International Labour Office to transmit copies of the resolution in question both to the Secretary-General of the League and to the Governments of all American States. Then, in June, 1936, we find the resolution unanimously adopted by the Twentieth Session of the International Labour Conference, on the proposal of the Chilean Delegation.

The conclusion of that proposal was that the Governing Body of the International Labour Office was asked to draw the attention of the Council of the League to the question of calendar reform, and at the same time to request the Council to recommend that the Advisory and Technical Committee for Communications and Transit should very carefully pursue the study of the whole of this question.

This resolution further requested that copies should be sent to the Secretary-General of the League and to States-Members and non-Members of the International Labour Organization.

In addition to these resolutions adopted by official assemblies and gatherings attended by State delegates, my attention has been drawn particularly to the resolutions adopted by bodies which, although private

in character, are none the less important both from the point of view of the objects they propose to achieve and also from that of the persons who are members of such bodies. For example, the Federation of Chambers of Commerce of the British Empire at a plenary meeting at the Fourteenth Congress held at Wellington, New Zealand, in October, 1936, unanimously adopted a resolution in which the Federation urges adoption of the perpetual calendar with 12 months with equal quarters of 91 days each.

I could easily give you further examples, but our time is valuable; I would merely stress the fact that since 1931 (the date of the International Conference which dealt with the question of Calendar reform) popular opinion throughout the world has increasingly shown its sympathy towards reform of the present Gregorian Calendar. We see that the most varying movements—religious movements including Catholic, Protestant and Orthodox,—as well as workers and employers, all show an ever-increasing interest in favour of the reform of the Calendar.

Members of the Council are aware of the fact that the Chilean Government is particularly interested in this question. It was the Chilean Government which submitted in 1936 to the Conference at Santiago, and also to the International Labour Conference in the same year, Resolutions the texts of which were adopted and which have been communicated to you. Today, on behalf of my Government, I have the honour to lay before the Council a draft Convention which I would ask you to consider as a contribution made by my country to the proposed study on calendar reform. This draft Convention will, I am sure, receive the attention of the competent organs of the League, and will be examined with all the interest that it deserves.

I would point out the necessity for the League's continuing this study with some speed. As the texts submitted to you show, the nearest date for the adoption of the universal calendar is Sunday, January 1st, 1939; and in these circumstances it is important that during the present year, Governments should be in a position to undertake the examination of a draft Convention which the Secretariat should be asked to submit to them.

As you will realize, the reform of the present calendar will be useful only if it is applied—if not by all countries in the world—at least by almost all. Hence it is necessary that an international Convention should be drawn up, and this should be the work of a diplomatic Conference.

It is with this result in view that I have the honour to propose to the Council that it should request the Secretary-General to undertake an enquiry from Governments with a view to learning their views and that it should ask them to submit their observations and considerations.

The results of this enquiry should be embodied in a Report which the Secretary-General would submit to the Council at the appropriate moment. On the basis of the observations made by Governments, the Council would

then be able to decide whether or not to convene a diplomatic Conference, and could convene such a Conference if it proved necessary with a view to drawing up a Convention for the reform of the calendar after the necessary studies and consultations have been carried out.

THE PRESIDENT: If there are no further remarks, I will ask the Rapporteur if he has any observations to make on the proposal just made by the representative of Chile.

M. LITVINOFF: I am sure my colleagues will appreciate the contribution of the Chile Government to the solution of this question, and I would suggest that this draft Convention be referred to the Advisory and Technical Committee for Communications and Transit, at the same time being brought to the notice of the Governments.

The Report, together with the Report of the Chile representative, was adopted.

The Director of the International Labour Office withdrew.

CHURCHES URGE U. S. GOVERNMENT ACTION

Action by the U. S. Government on calendar reform is urged by American churches in a letter addressed to President Roosevelt and Secretary of State Hull. The letter says:

"Dear Mr. President:

"At an earlier date it was my privilege as American Executive of the Universal Christian Council to forward to you and to the Secretary of State for your records the report of the action of the Federal Council of the Churches of Christ in America and of the Universal Christian Council in connection with the request of the League of Nations concerning the attitude of the Churches of the world in the matter of Easter stabilization.

"At this time, in view of the request of the League, which I am given to understand has been transmitted to all nations whether member states or otherwise, I am venturing to lay before you for inclusion in your records and for such attention as the matter may deserve, a brief dossier of further facts relevant to the Churches and Calendar Reform.

"I would respectfully call particular attention to the resolution taken by the Council at its meeting in Chamby, Switzerland, August 21-26, 1936. Pursuant to the last paragraph of that resolution and with the authorization of the Federal Council's Department of Relations with Churches abroad, of which I am secretary, I am reporting for the Council the results of its own studies which show a quite general readiness on the part of the Churches of the Protestant Faith for a reform of the Calendar along the lines indicated by the proposals of The World Calendar Association.

"May I simply express the personal hope that in this matter, so obviously free from political complications, the American Government may find it possible to act with other governments to bring about a change which seems highly desirable and which will rid the world of at least one basic disunity by bringing all nations and Churches to the use of the same Calendar.

"Yours faithfully,

"Henry S. Leiper, Executive Secretary."

New York, March 9, 1937.

FOREWORD

By H. E. SAO-KE ALFRED SZE

Chinese Ambassador to the United States

The League of Nations at Geneva appears to have taken up the reform of the calendar in good earnest. Since the calendar enters into the daily life of every people on the face of the earth it is desirable that there should be uniformity in the methods of reckoning time for all nations.

One of the first acts of China on becoming a Republic was to discontinue the time-honored calendar which had been in use for hundreds of years and to adopt the Western Calendar in its place. The reform of the calendar is therefore a subject in which the Chinese people are intensely interested.

Dr. Ch'ing-Sung Yü, Director of the National Institute of Astronomy at Nanking, has given us an account of the progress China in recent years has made in reforming the calendar. There is reason to believe that China will not fail to keep step with the nations of the earth in the adoption of The World Calendar when the proper time comes.

CHINA VOTES FOR REVISION

By CH'ING-SUNG YÜ

*Director of the National Institute of Astronomy,
Purple Mountain Observatory, Nanking, China.*

MORE than 100,000 persons were consulted by the Chinese Association for the Study of Calendar Reform before a report was submitted to the Nanking Government as to the attitude which China should take at the forthcoming discussions before the League of Nations at Geneva. The result of this exhaustive questionnaire is embodied in formal recommendations which the Association is now making to the Chinese Government, to insure that by 1939 China will be ready to join the rest of the world in adopting The World Calendar.

Our Association is composed of representatives from the Ministries of Foreign Affairs, Railways, Finance, Communications, Industries and Interior, together with delegates from the National Institute of Astronomy of the Chinese Academy of Science.

The Association was organized at the suggestion of the League of Nations. After considerable study of the whole question of calendar reform, a small booklet was printed covering the main points of the subject and outlining the two major proposals for a new calendar—the 12-month

世界曆

THE WORLD CALENDAR

余青松

第 一 季	一月							二月							三月						
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	22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
	29	30	31					26	27	28	29	30			24	25	26	27	28	29	30
第 三 季	七月							八月							九月						
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	29	30	31					26	27	28	29	30			24	25	26	27	28	29	30
第 四 季	十月							十一月							十二月						
	日	一	二	三	四	五	六	日	一	二	三	四	五	六	日	一	二	三	四	五	六
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	15	16	17	18	19	20	21	12	13	14	15	16	17	18	10	11	12	13	14	15	16
	22	23	24	25	26	27	28	19	20	21	22	23	24	25	17	18	19	20	21	22	23
	29	30	31					26	27	28	29	30			24	25	26	27	28	29	30*

* 年終日，額外星期六，定為國際休假日。

十閏年所加之閏年日，額外星期六，定為國際休假日。

equal-quarter plan and the 13-month plan. This booklet was distributed to officials, teachers and internationally-minded persons throughout every part of China, together with questionnaires inviting an expression of preference as between (1) the present Gregorian Calendar, officially adopted throughout China in 1912, (2) the 12-month equal-quarter plan, and (3) the 13-month proposal.

Out of approximately 100,000 persons consulted, 81 per cent voted in favor of The World Calendar, 9 per cent preferred the 13-month plan, and 10 per cent were against any change. The vote is not only quantitative, but also comprehensive, as it represents opinions from practically every phase of life in China.

The result of the questionnaire was submitted to the 21st annual convention of the Science Society of China, which fully approved of the majority opinion and passed a resolution urging the government to give its approval to adoption of The World Calendar at the earliest suitable date.

Why should the Chinese people overwhelmingly prefer the 12-month plan, rather than the 13-month? There are several reasons, but one of the most important of them has its basis in the "mathematical mind" of the Chinese. To them, 12 is a most natural and convenient number. Its symmetry and sub-multiplicity render easy the division of the year into convenient parts—four seasons, for instance. Each month corresponds exactly to one of the 12 Chinese Zodiacs. The 24 important "solar terms" in Chinese chronology require 12 months for their equal and symmetrical distribution. The number 13 would play havoc with countless cherished traditions and habits.

Chinese interest in calendar reform is of long standing. In fact, a press report has been widely published to the effect that a Chinese scientist was one of the originators of the plan now internationally known as "The World Calendar." I have not been able to find any confirmation of this report, but it would not be surprising if it were true, for Chinese savants and thinkers have often been the forerunners of ideas and inventions which later became world-wide in their application and adoption. Our Association during the past few years has received numerous "original" proposals for calendar reform from correspondents in all parts of China, and it is astonishing how many of these, though independently arrived at, closely resemble the plan approved by the League of Nations under the title "The World Calendar." This would seem to prove very clearly that the 12-month equal-quarter plan suits the Chinese mentality and habit of thought.

China's interest in Western proposals for calendar revision is quite understandable. Modern China is not like ancient China. In earlier times the country could successfully shut its doors against the outside world. Today she is inextricably connected with the rest of mankind, whether she likes it or not. What affects the West affects China, and vice versa.

Calendar reform is no exception to this general rule. A new calendar cannot possibly be universal unless it is attractive to the 400 million inhabitants of China, who comprise one-fourth of the population of the globe.

For thousands of years China used what is commonly called, though not quite correctly, a Lunar Calendar. This consisted of 12 lunations per year, with seven extra lunations in every 19 years. These intercalary months were necessary in order to reconcile and regulate the seasons.

Chinese scholars were not lacking in devising and advocating new and better patterns for time measurement, and numerous "reforms" took place down the ages. But they were mainly concerned with revisions of the intercalary months. The essential features of the old calendar were preserved until the establishment of the Republic, when in 1912 the Government issued a mandate abolishing the old system and imposing in its place the western or Gregorian Calendar. Despite official taboo, the old calendar persisted in popular use: human habits and traditions are too strong to be broken down by the mere promulgation of an edict. Today, after 25 years, the majority of the people still cling to the calendar of their ancestors.

However, this does not mean that the western calendar will not eventually triumph. Both the government and the more enlightened circles of the citizenry have wholeheartedly adopted it, and they are vigorous and sincere in their encouragement of the new calendar and in their disapproval of the use of the old and inefficient one. There is continual progress, and it is only a matter of time before the ancient almanac will be completely abandoned.

Fortunate for China, I think, that the world-wide agitation for revision of the Gregorian Calendar comes just at this time—before some of the faults of the Gregorian system have completely taken root and been crystallized in the Chinese popular mind.

The old Chinese calendar, as I have said, is wrongly dubbed "lunar." The moon played a prominent rôle, but it was not the whole story. For besides the lunations, the ancient calendar contains also the *Cheh-ch'i* or Solar Terms, evenly distributed throughout the solar year. To be exact, they represent the times when the sun is at Celestial Longitude 0°, 15°, 30°, and so on every 15 degrees. Thus in 360 degrees or a complete circuit of the Sun—that is, a solar year—there are 24 divisions of 15 degrees each. The 0 point and the 180 degree instant are the equinoxes of the West, while the 90 and 270 correspond to the solstices.

It is clear then that the old Chinese Calendar is not just lunar, but luni-solar. Chinese farmers, who compose the main bulk of the population, measure time mainly by solar terms. Thus a change from the old system to any new solar calendar is happily not as drastic as it seems. Western readers are probably familiar with some of the picturesque names of the solar time-periods, such as Spring Showers, Corn Rain, Summer Begins, Moderate Heat, Great Heat, White Dew, Frost, Light Snow, Heavy Snow, Moderate Cold and Severe Cold. Most of these names serve only as convenient designations for the 24 divisions of the year, and their meanings should not be taken too literally.

Since time immemorial the compilation of calendar data in China has been in the hands of official "astronomers," whose position was one of great honor and dignity. It was their duty to determine the length of the year, the time of new moons, and the duration of the 24 solar positions.

Even today the Government Official Almanac is carefully compiled every year by the National Institute, housed in the government astronom-

ical observatory on Purple Mountain. Upon the Institute falls the duty of leading and guiding all discussion of calendar reform even though the question no longer deals with the length of the year or month, but resolves itself into a matter of the logical distribution of days, weeks, and months in the year. This makes the reform problem commercial, political, social, and religious, rather than purely astronomical. However, it does not mean that astronomers should not be consulted, for as long as times and seasons are determined from the observation of celestial phenomena, the astronomer's opinion will continue to carry weight. In fact, it has been pointed out (most clearly and convincingly by Prof. C. C. Wylie of Iowa and by Capt. J. F. Hellweg of the U. S. Naval Observatory) that for many good technical reasons, the 13-month plan is not acceptable to the astronomer.

That revolutionary China decided to discard its age-old calendar for the western system was but a natural step in modernization. Although the ancient Chinese calendar possessed some definite advantages over the new one, such as the fixity of new moons which renders easy the prediction of tides for those living along the coast and also facilitates the observance of religious festivals depending upon the moon, these advantages were outweighed by the all-round clumsiness of unequal years and the wandering of the 24 solar terms. An even more serious objection to the old calendar was the necessity of compiling it every year. In other words, the calendar was not perpetual. However, China adopted the Gregorian Calendar in 1912, not because of its modernity (which it certainly is not), but rather because of its universality. Now that the nations of the world are seriously planning for a revision of the Gregorian System, China will certainly not be backward in participating in this movement.

The question of calendar revision in China was first formally discussed in 1927 during a national educational conference held at Nanking, at which the 13-month calendar came up for consideration. The novelty of the proposal seemed to strike the fancy of the delegates, for a resolution was proposed urging that China put the novel calendar immediately into effect. The eminent scholar-educator, Dr. Hu Shih, however, advised caution, and pointed out that so weighty a problem should have extensive study outside the educational field, and also internationally, for a new calendar requires universal agreement among nations for its successful enactment. Action was finally delayed pending further investigation, and wisely so, for when the proposed reform was presented for consideration to the people in general embracing practically all walks of life, they voted strongly against the 13-month novelty and in favor of the 12-month plan.

As far as China is concerned, the week is an imported product. Although it has gained wide usage of late, it is not as important in the East as in the West. The Chinese habit is to divide the month into three periods, or *sün*, of 10 days each, namely the upper, the middle, and the lower *sün*. The period of 12 months of 30 or 31 days is the best for the usage of *süns*.

Another widely used time interval is the Sexagenary Cycle, or *Chia-Tsu*. This system reckons days by cycles of 60. It is an invention credited to Huang Ti, the first great Emperor of historic China who reigned more than 4000 years ago. It is used in a manner not unlike the Julian Day System in Astronomy, by which days are numbered consecutively in an unbroken manner, irrespective and independent of other calendars. The *Chia-Tsu* System also applies to the reckoning of years, months, and hours. It is evident that everyone who uses this cycle of 60 will oppose a 13-month civil calendar and demand the 12-month year.

In closing, may I say that in my studies I have found The World Calendar the most logical, practicable and convenient system of time measurement yet devised.

P. W. WILSON'S NEW BOOK

His "Romance of the Calendar," just published in London and New York, is reviewed by a group of distinguished and appreciative critics.

Mr. Wilson's book, which appeared in January, has been acclaimed by the literary reviewers as "the most important book on the subject of calendar reform which has ever been attempted." After patient and comprehensive research lasting over a period of more than two years, the author has gathered a wealth of material on a vast and in large part unfamiliar subject. The result is a book of 351 pages, illustrated with drawings and charts, which has been sumptuously published by W. W. Norton & Co. in New York, and by Allen & Unwin in London. In the following pages, Mr. Wilson's labors are sympathetically reviewed by international authorities on the subject.

IS IT REALLY A "ROMANCE"?

By THE ABBÉ CHAUVE-BERTRAND

Author of the recently published book "La Question de Pâques et du Calendrier"

WE HAVE here an important and remarkable work. To me, it is particularly interesting since it deals with a subject with which I have been occupied for many years. I can understand the significance of the volume. It pleases me also for another reason. I like books which unfold the evolution of an idea—of an institution—of a custom—for instance, the history of burial from earliest times and through the ages, the development of human habitations from caves and huts to modern palaces, the history of writing and so on. It is not often that a book gives us comprehensively the material by which we can observe and understand the story of the calendar in this progressive manner. This book enables us to follow that long story without difficulty.

The application of the word "romance" to this work errs on the side of modesty. It is only to be understood as implying a stimulus to the imagination. The book includes science and history but written in such a fashion that the narrative is never dry. It is, on the contrary, as agreeable as it is instructive. One surveys, as one reads these pages, the broad range of astronomical development and one catches glimpses of the progress of civilization throughout the ages and, at the same time, of the home life of all peoples. For it seems to be clear that among the sciences which do honor to the human mind, a study of the stars is the most ancient. Primitive man had neither books nor parchments. But he could gaze quite naturally upon the great book of the heavens. He could follow the movement of brilliant stars and was thus able to arrive at his earliest measurement of time. From the lunations of the moon were derived the months and the weeks. The year was reckoned according to the course of the sun.

And then it is not only astronomy and chronology that one studies as one follows the history of the calendar. We are shown the achievements also of people whose lives were regulated by the periodic return of the stars or the constellations—for instance, in Egypt where the flooding of the Nile was announced by the beautiful star Sirius. Even the culture of ancient civilizations has been subject to the influence of the arrangement of time in their calendars. Indeed, it has often happened that astrological superstitions have been added to the more genuine beliefs. In Egypt and Babylon, the temples provided platforms, open to the sky. During calm nights, the priests of Thebes or of Memphis, of Nineveh or of Babylon would watch the movement of the stars. It was the practice of the Hebrews to wait for the lunation to announce the new moon. In classical times, the new moons were of great importance to the Romans among whom the first day of the month was known as the Calends.

The volume contains a number of well-chosen illustrations. I may call attention to the very curious Stone of Mexico whereon is carved an Aztec Calendar. Here is one of the archaeological treasures of Mexico which deserves to be safeguarded with the utmost care. There is also a map of chronometrical zones which shows what hour it is by the sun at any given moment in different parts of the world. I should like moreover to mention the double swastika appearing on page 321. I have myself written at various times about the swastika and I have been much interested in the account here given of its origin—also in the explanations of the symbol. According to my own conjectures, the symbol derives its origin from the movement of the boreal stars around the north pole and, in an inverse sense, from the austral stars around the south pole. The swastika itself has had a definite place in the primitive calendars.

I will not attempt to offer a *résumé* or summary of the work. It must be read in its entirety and some of the pages may well be read a second time. We are told how man first reckoned the lunar months before calculating the solar year and how he evolved a cycle of weeks. Mr. Wilson touches upon the very difficult question of the birth of Jesus—the paschal moon—the formation of the zodiac with its 12 signs in accord with the 360 degrees of the celestial sphere—the division of the year into 12 months as ancient as the remotest antiquity—the division of the day into 24 hours, of the hour into 60 minutes, of the minute into 60 seconds out of which immense survey triumphs the number 12.

Having followed the evolution of the calendar from its furthest origins to our own day, we are in a position to appreciate its perfections and imperfections—what still needs to be done in order to remove the imperfections. Nothing that lives in the thought of man can be immobile, and Part V of the Book is thus devoted to the future of the calendar. The author examines the plan of Auguste Comte who proposed a year of 12

months each containing 4 weeks of 7 days. Mr. Wilson states the grounds for the conclusion that this plan is impracticable. Next he explains The World Calendar of 12 months with equal quarters of 91 days; he shows its advantages and makes it clear that this is the plan to which the very great majority of the partisans of the reform of the calendar have rallied for several years.

At the risk of writing at undue length, I would like to mention once more the final chapter, entitled *The Healing of Time*, which concludes the whole work. In these last pages, the horizons are broadened so as to embrace the benefits which all peoples within the family of mankind would derive from the reform of the calendar, first as an advantage to individuals in their own lives, then as men of good-will who are trying to reconcile political states, the interests and groupings of commerce and religious communities within the true commonwealth of mankind.

At the outset of this review I suggested that the word "romance," as applied to this book, is too modest and not quite exact. I have given my reasons for this view. This is a work which, without being didactic, is nevertheless full of science and history. Yet the word "romance" is, after all, justified. It shows that a clear and instructive book may read like a romance, and this readability is by no means to be regarded as a defective quality in this kind of treatise.

* * * * *

A MODEST BOOK—AND CONVINCING

By J. B. PERRY-ROBINSON

British Authority on Calendar Reform

I NOW KNOW for the first time what the Precession of the Equinoxes is. Kipling says there is nothing left of the Equinoxes, the Precession having preceded according to precedent on the day when the Elephant's Child set out to get a new nose. But Mr. Wilson offers no evidence to confirm their obsolescence. He offers instead a beautifully simple analogy of a spinning-top—such as one may see whipped in any village street just at this time of the year—which has made the whole matter so lucidly clear to me that I can scarcely refrain from telling it to everyone. However, I will not do that here, for I hope that other readers of the Journal will have the same pleasure as I in discovering this simple explanation in Mr. Wilson's book.

I am grateful to Mr. Wilson for this discovery, and I am grateful to him for a number of other pleasing additions to our store of miscellaneous information. The lore of calendar-making, in which he is so expert, is full of charming oddities, and, apart from the serious matter to be derived from his book, one can spend a very entertaining hour browsing on his

more erudite chapters. For instance, I find that the names given by the Tongan islanders to their months include such curiosities as Little-Yams, Yams-with-Small-Protuberances, Throwing-Soil-on-Branches, and Yellow-Heads-on-Fish. The Chinese also, I learn, have a division of the year called Agitated Insects. Even the horrid Aztecs, with their insatiable deities demanding 20,000 human sacrifices a year, used such pleasing names as Wind, Sugar-Cane, Flint, Music, Flower for their months. Elsewhere in the course of his survey of the manifold strange systems of time-measurement used in the world, Mr. Wilson seems to provide support for the well-known theory that the moon is made of green cheese, when he records that it is the practice of the Trobriand islanders of New Guinea to call the new moon "unripe" and the full moon "high."

It is startling to discover that the month of April—that epitome of gentle spring-time—was once named after Nero, as July is after Caesar and August after his successor. The peculiarities of the Roman Calendar, however, are of more than merely casual concern to us, since it is still in large measure their calendar which we use today. Mr. Wilson answers very satisfactorily those numerous conundrums which any reflection on our familiar calendar etymology immediately raises and for the solution of which we must look back, not only to B.C. but usually to A.U.C. Why poor February should only have 28 or 29 days, he still leaves shrouded in some mystery—it is apparently a very delicate point of Latin archaeology—but he explains many other more complicated matters, such as the Julian system of leap years and its subsequent revision by Pope Gregory, very lucidly and thoroughly. He deals comprehensively with the fantastic "Easter Moon," that hypothetical luminary which wanders through an imaginary sky over a space of five weeks, and he delves into the obscure origins of the great controversies in the early Christian Church which gave it birth.

The book throws much valuable light on many other aspects of the Christian and the civil years and rescues from oblivion many facts which it would be sad to have forgotten, such as the significance of Lammas-tide, Hallowe'en and Candlemas or the proper function of the Signs of the Zodiac; and on the great astronomical puzzles which have faced all calendar-makers from the pyramid-builders of Egypt to the Astronomer-Royal of Greenwich, it is impressively compendious and lucid. It is indeed excellent to have at hand a work that will tell one in successive pages the meaning of the Sothic and Metonic cycles, explain the origin of the three gold balls over the pawnbroker's shop, and give an analysis of the weather in the 40 days following St. Swithin's Day throughout the last 50 years.

But Mr. Wilson's book has more solid merits than this. It is not merely a cyclopaedia of out-of-the-way information. It presents a convincing picture of the weaknesses of our existing calendar and of the advantages of

a reasonable reform of it. It faces squarely the arguments of certain minorities against reform, and makes its case for the introduction of The World Calendar the more surely for being fair to both sides.

As Mr. Wilson says himself in his Foreword: "Innumerable astronomers, mathematicians, archaeologists, ecclesiastics, historians, poets, artists, and philosophers, have contributed to our knowledge and appreciation of the many calendars by which man has sought to measure time. But there does not seem to be any book of convenient size—at any rate in the English language—that surveys the development and the significance of the calendar as a whole."

That gap Mr. Wilson has conclusively filled. He does not claim to be a pioneer of research, one of those "patient investigators," in his own words, who "have toiled with the spade in the dust of buried cities, scanned the heavens with telescopes, observed primitive tribes in the South Seas and labored over scarcely decipherable inscriptions." His prime object has been simply to "make more widely known the value of their work." This is modest self-effacement, and, in fact, the labor of accumulating so much material and digesting it into a convenient size must have been very considerable.

Last October in this Journal, the Abbé Chauve-Bertrand's book "*La Question de Pâques et du Calendrier*" was reviewed. It is not unfair to compare Mr. Wilson's book with the Abbé's. If Mr. Wilson's larger work has not the grave judicious scholarship of the Abbé's brief but comprehensive treatise—what Mr. Wilson himself in these pages called "its exquisite and ultimate lucidity"—it has an easy lightness in the presentation of an astonishing mass of information which should make it an eminently popular book. Moreover, the tempo of his style is swift, and the author hurries onward with an invigorating enthusiasm which makes it easy to follow him in his most remote and abstract disquisitions.

First and foremost, however, to those of us whose hearts are set on the achievement of a perpetual 12-month calendar, the value of the book lies in its clear and satisfying advocacy of The World Calendar. It is, he says, the "logical year." In a world which "resounds with declamation that sometimes seems to express little more than the insanities of hatred," he continues, "we read the arguments of those who favor a World Calendar and we find ourselves in a different atmosphere. These are sensible arguments, advanced by people in a normal state of mind." He finds, moreover, that The World Calendar yields a maximum of equalization and adjustment of weeks and months with a minimum of disturbance to familiar customs and traditions. The change from the Gregorian to The World Calendar would be much less drastic, as Mr. Wilson points out, than the addition of two months by Julius Caesar or the omission of ten days by Pope Gregory XIII.

A BOOK WHICH FILLS A LONG-FELT WANT

By GEORGE KENT

Director of Public Information for the League of Nations Association of the U. S. A.

THIS beautifully printed, 351-page volume is a dramatic, swift-moving piece of scholarship that will materially aid the cause of calendar reform. Here at last is a book on the calendar that the layman can read—and read to the end without falling asleep. It should do a great deal to arouse the public from its lethargy on this important subject.

In surprisingly little space, Mr. Wilson has contrived to set forth all the essential facts that bear on mankind's long struggle to understand and measure time, and through them to prove conclusively—to my mind, at least—that the next forward step must be the adoption of The World Calendar, the plan proposed and approved by the League of Nations. This, he holds, is the calendar of the future and he urges its adoption by 1939, when the first of January falls on a Sunday.

For the 13-month calendar, as originally proposed by Comte, Mr. Wilson has little favorable to say. He believes it is an impossible plan because of certain inherent defects and for the reason that human beings are reluctant to make radical changes in their calendars.

The history of the calendar starts with primitive peoples and their amusing and frequently picturesque methods of counting days and months. In Tonga, an island in the South Seas, the yam is the unit of the year, the name of the month changing with the state of the vegetable. The first month is "little yams"; the second is, "yams with small protuberances"; the last, "banking soil over yams." Our American Indians named the months: Cold Moon, Hunger Moon, Crow Moon, Thunder Moon, Green Corn Moon, Harvest Moon; and finally, "Long Night Moon."

Calendars, as we know them today, go back to rudimentary beginnings in Egypt, 7000 years before Christ. The first measurement of the year was also accomplished in Egypt by priest astronomers who used the pyramids as a measuring device in the year 4700 B.C.

Long before the Christian era, the seven-day week was in use, sundials were measuring the hours, water clocks were dripping minutes, and a Babylonian astronomer had figured the solar year as a unit containing 365 days, 6 hours, 15 minutes and 41 seconds. That was only 26 minutes and 55 seconds too long.

Bound up with the calendar has always been the problem of the sun and moon and stars. The calendar belonged to the astronomers and the astronomers were the priests. In Mexico, the remarkable Mayan calendars, intricately and beautifully wrought, weighed fifty tons and each was a sacrificial altar. Into a hole at the center of the calendar, the heart of the victim was thrust—on some days the hearts of 70,000 persons.

In Rome, the poor man who wanted to know a holiday or tax or planting date was obliged to pay for it—payment going to a priest. Revolution, bloody and slave-led, freed the calendar from the priests and a few years afterward Julius Caesar arrived to establish the Julian Calendar which differs little from the calendar as we know it today. It remained the effective calendar, with trifling modifications, until 1582, when Pope Gregory proclaimed the Gregorian Calendar, our present almanac.

The progress of the calendar has influenced the architecture of all lands. The struggle to understand time stimulated men to the making of new inventions. Mr. Wilson gives us in entertaining capsules, the history of lens making, the story of clocks and watches. His readers will not fail to be entertained by the tale of a sundial that fired a cannon at noon, or by the description of that marvelous water clock of the Emperor Charlemagne which had twelve doors. The first door opened, one ball rolled down and struck a brass gong; the second door had two balls, and so on.

Devices for measuring hours are almost myriad in the history of time, and there was a time when calendars were almost equally numerous and varied. But modern methods of communication have eliminated the archaic machines for counting the days and the months and the years. There are only a handful left. Those that remain are to a degree in conflict and Mr. Wilson has done all that is humanly possible to iron out the differences and to make clear that adoption of The World Calendar means the sacrifice of neither sentiment nor sovereignty. "The arrangement of time according to The World Calendar," writes Mr. Wilson, "symbolizes a conception of culture that includes differing cultures within the embrace of a mutual kinship of ideas. It is the latest word in a story as old as man himself—a story in which all generations have played a part."

The author of the *Romance of the Calendar* has produced a fascinating book which fills a long-felt want in libraries, both public and private. His style is at once simple and entertaining, informative and picturesque. I like the modesty with which he approaches his subject in a brief foreword which should stand as a model for all future authors of scholarly books—"my object," he says, "is to share the pleasure of my pursuit of calendar knowledge with the public that uses the calendar."

The book, Mr. Wilson cheerfully admits, is really a collaboration, but a collaboration with a vast army of authorities over whose writings Mr. Wilson has spent a vast amount of painstaking research, and his findings have been submitted before publication to a jury of the greatest living authorities, including Lord Desborough of England, Dr. Hans Platzer of Germany, Dr. deCastro of the League of Nations and the highest officials of the U. S. Bureau of Standards and the U. S. Naval Observatory. If his conclusions have the approval of such eminent experts, I doubt whether any ordinary critics will have the temerity to find fault with the author.

INTERESTING AND READABLE

By C. C. WYLIE

Professor of Mathematics and Astronomy, University of Iowa

FOR many years persons studying the calendar and its history have not had an interesting and readable, but reliable and complete, book to consult. Probably the best available to English and American readers have been the two books by Alexander Philip, but these are by no means complete, and there are some inaccuracies. For a really good understanding of the subject, it has been necessary to delve into various learned volumes and journals, some of which read like legal documents. Well informed persons have at various times pointed out the need for a good book on the subject; and Mr. Wilson's book has been prepared to answer this need.

Following the introductory paragraphs, Mr. Wilson describes the early calendars of the Babylonians and others, in which the year was kept with the seasons and the month with the moon. In this type, the sky itself was the calendar. Early man was not concerned with an accurate length of the year in days, or with a formula for leap year. He looked at the sun and stars to see the time of year, and at the moon to see the time of month.

Mr. Wilson discusses at some length the Egyptian calendar, one of the most interesting used by early peoples. He follows Breasted in adopting 4241 B.C. as the approximate date at which the Egyptians adopted their rigid rule for a 365-day year. We agree with Johnson (*Journal of Calendar Reform, December, 1936*) that this date is too early. As the stars make a complete cycle with respect to the seasons in 25,800 years, the change is a month in 2150 years on the average. The heliacal rising of Sirius would have occurred too far ahead of the solstice at that early date. Other calendars discussed by Mr. Wilson are the Chinese, Hindu, Mohammadan and Greek.

The Roman calendar and its reform by Julius Caesar are discussed at length. Here Mr. Wilson gives two versions. One of these, which he calls the "traditional," is given in the majority of textbooks and encyclopedias. The other, which he calls the "later," is found chiefly in research publications. This is the version given by writers who cite ancient documents in support of their statements, and it differs from the traditional on important points. First, some centuries before the time of Julius Caesar, a cycle was used which included the occasional intercalation of 22- and 23-day months. Such intercalations would change the relation of the moon to the month by a week. Hence for centuries before Julius Caesar there could have been no effort to keep the beginning of the month at new moon. Next, the beginning of the year was changed to January 1 in 153 B.C., not by Julius Caesar. Finally, Julius Caesar adjusted the lengths of the month to be what we are now using. Augustus did not disturb the lengths.

As research writers of different nations and different periods agree on

the "later" version, we owe our apologies to Augustus for ever believing that he took a day from February and added it to August. But the "traditional" version is a good story, evidently written by a good journalist. It has been in circulation for centuries, and in spite of the research experts, it will probably be read and believed centuries from now. Stories of seeing stars by daylight from the bottom of a deep well or mine shaft have circulated for centuries, in spite of the astronomers and mining engineers who know that such tales are invention or imagination.

After discussion of the Julian reform, Mr. Wilson takes up the Jewish calendar. He also discusses the conflict on the date of Easter between the early Christians of Jewish and Gentile descent. This may be summarized by saying that both groups, because of sentiment, wanted to follow the calendar used in Jerusalem at the time of the crucifixion and the resurrection. But the Jewish Christians wanted to use the date of the Passover, or the first full moon of spring. The Gentile Christians preferred to break away from the Jewish date and celebrate the resurrection, which was on the Sunday following Passover, or the Sunday following the first full moon of spring. The Gentiles won, so the Church fathers decreed that Easter shall be celebrated on the Sunday following the first full moon on or after March 21, the first day of spring.

The concluding chapters of the book discuss the 13-month calendar advocated by Comte and later by George Eastman, and the 12-month equal-quarter calendar now known as The World Calendar. The merits of the two proposed reforms are discussed and compared.

CALENDAR'S SURPRISING HISTORY

By KATHERINE WOODS

In the New York Times Book Review Section

WE TAKE the calendar for granted. And even when P. W. Wilson reminds us, at the beginning of his book, that this universal and immemorial convenience has been brought to us by the amazing endeavors of man's mind through the ages, we are far from realizing how curious and complicated those endeavors have been. This book tells us.

Yet amazing remains probably the best word for the events and circumstances here set down. It is amazing that primitive peoples should have hit upon such workable methods for marking out the days and seasons. It is amazing that our own calendar should have come down to us by so direct a line from the Egyptians through the Romans to Pope Gregory XIII in 1582; and it is amazing that this present calendar differs so little from Julius Caesar's. It is amazing to learn that the Mayan civilization had a calendar very like ours. But it is no less amazing to learn that in India at this day fourteen different calendars are in use, in addition to the Gregorian, Mohammedan and Jewish apportionments. Perhaps it is not surprising to be told that the Chinese calendar, not wholly superseded by the Gregorian until 1930, has been the most long-lived in the world; but the length of its life—almost 4,300 years—is nothing short of astounding. With patient and comprehensive research Mr. Wilson has gathered a wealth of material on a vast and unfamiliar subject. And he has given us, thus,

the first readable and convenient book in our language, which not only points out the romance of the calendar but relates its history. A most interesting history it is. It stretches back into dim eras (the first traces of a primitive calendar in Egypt are ascribed to a period about 7000 B. C.). It looks forward into the future with suggestions of calendar reform. It is a history which has been closely bound up with the two most vital forces of developing civilization—religion and agriculture. It is highly scientific, though it deals with the simplest practical necessity. In "The Romance of the Calendar" we grasp the subject's technical difficulties, at the same time that we see, in varied detail, the calendar's connection with man's progress everywhere.

As Mr. Wilson sums it up in one of his earlier chapters, the thing seems fairly simple: "The rotation of the earth around the sun gives us the year, the position of a star in the heavens suggests a point in time from which to measure the year, the rotation of the moon around the earth gives us the month, and the spin of the earth on its axis gives us the day." And long, long ago men worked out the solar year as 365½ days long, and the length of the lunar month as approximately 29½ days. But there, so to speak, they stuck. How to divide up such figures into forms of any regularity seemed an insoluble problem.

The year's extra quarter-day can be dealt with by the institution of leap year. But the conflict between the solar year and the lunar month was in reality hopeless, and the authority of one had to be given up. The Babylonians kept to the lunar basis, on which men had first begun to make a calendar count. But the Egyptians discarded this measurement and made the sun their arbiter. Probably in 4241 B. C., the Egyptians adopted a twelve-month calendar based on what was in effect the solar year (though they measured it from the dog star). After experimenting with a lunar calendar the Romans, under Julius Caesar, worked out a time measurement on the much more convenient solar plan. The Julian calendar was established in 47 B. C. Although the Emperor Augustus made some adjustments thirty-nine years later (the months of July and August perpetuate these reformers' names), Julius Caesar's calendar endured, basically, for fifteen centuries in the Western world.

But meanwhile there were many other calendars, forms of time measurement. And not the least interesting feature of Mr. Wilson's exceedingly interesting book is the variety of curious detail which he brings us in regard to these other developments of this basic utility, over the world and down the centuries. There was the Mohammedan calendar. There was the Jewish calendar. Omar Khayyam made a calendar in Persia. There were the Maya and Aztec calendars. There is the background of those many calendars of India. And, down to our own day and our own scene, there is the adoption of our method of dating, something about the measurement of the hours and the question of standard time and of the date of Easter. With a careful examination of the proposed World Calendar Mr. Wilson completes an enjoyable and richly informative book.

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NUMBERING OUR DAYS EFFICIENTLY

By HUNTINGTON CAIRNS

Book Reviewer of the *Baltimore Sun*

MR. WILSON here presents a popular history of the development and meaning of the calendar. It is a subject which is still a lively one. In August, 1935, a thousand Rumanian peasants rioted and several were killed and injured. The parish priest had insisted upon celebrating festivals of the Eastern Orthodox Church according to the Julian calendar, whereas the police insisted that he should have followed the modern law which required observance of the Gregorian calendar.

The riot was a repetition of the ones which occurred when the Gregorian calendar was adopted in England in 1752. At that time the Julian calendar was ahead of the Gregorian by eleven days, and England suppressed September 3 to September 13, inclusive. This meant that September 2 was followed immediately by September 14.

Rioting immediately broke out, some claiming that they had been cheated of wages for eleven days and others that their lives had been arbitrarily shortened by the same length of time.

Caesar was, of course, the instigator of the Julian calendar. At the end of B. C. 47 the calendar had run ahead of the sun and had gained more than two months of time. Caesar called upon an expert astronomer of Alexandria for advice, who called his attention to an early Egyptian calendar which had never been put into effect. Caesar, as Pontifex Maximus, performed a bold surgical operation upon the Roman calendar. He abandoned the lunar year; he adopted the solar year of 365 $\frac{1}{4}$ days, and provided that the civil year should be what it is today—namely, 365 days. A provision was made for a leap year every four years. In order to carry out this reform it was necessary to add two extra months to the year. Upon the adoption of the new calendar the Governor of Gaul insisted that in the lengthened year two months' extra taxes should be paid.

The Julian year, however, was too long by 18 hours 43 minutes 20 seconds in a century. In a thousand years the discrepancy amounted to 7 days 19 hours 13 minutes 20 seconds. By the middle of the sixteenth century the discrepancy had amounted to a little more than ten days. Not, however, until 1582 was it ordained by a later Pontifex Maximus, Gregory XIII, that eleven days be omitted from the calendar and a new system of calculation instituted. Queen Elizabeth, hardheaded and practical, studied the new calendar with care, but ecclesiastical politics stood in the way of any concession to Rome. It was thus not until the year 1752 that England and her American colonies adopted the new calendar. There is at least one American community—the hamlet of Rodanthe, on North Carolina's Cape Hatteras—which still celebrates "Old Christmas" (Jan. 5).

Today seventeen important calendars are in use in India. For four of these calendars the Government of India prints an official almanac containing 3,273 pages. The London *Times* has pointed out that "every thirty years, for two or three years in succession, a Mohammedan period of mourning, dependent upon the lunar calendar, overlaps and clashes with the Hindu period of rejoicing fixed by a solar calendar."

August Comte is perhaps the most eminent philosopher associated with calendar reform. He adopted a year of 364 days, which he divided into thirteen months of twenty-eight days each. This so-called thirteen-month calendar is in current use by a large American camera firm. The chief weakness of the calendar is that thirteen is a prime number and cannot be divided into factors of any kind.

Mr. Wilson strongly advocates the adoption of the so-called World Calendar, based on the use of 364 days, with a year-end day reserved at the end of December. A leap-year day is added for leap year and is inserted at the half-year between the end of June and the beginning of July. The calendar is arranged in four quarters of ninety-one days each. Each quarter contains exactly thirteen weeks and begins with a Sunday and ends with a Saturday. The long months of thirty-one days have five Sundays, the short months of thirty days have four Sundays. All the months have thus twenty-six days left for the normal conduct of business.

Mr. Wilson's case for The World Calendar is stated strongly, and perhaps unanswerably. Its advantages are obvious, and if rational factors in the conduct of human affairs were controlling it would no doubt long ago have been adopted.

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COMMENT FROM OTHER REVIEWERS

Saturday Review of Literature: A friend gently gibed me the other day by saying, "You like odd books, don't you?" Well, why not? It is interesting to roam over the broad field of book publishing and observe the rather numerous small flowers of learning and research which are non-assertive and easily passed by. I am delighted when I come on one of these; and such a one is Mr. Wilson's entertaining book on the Calendar. If you are irritated by the inability of the human race to decide whether to

set all clocks ahead an hour at a given moment it is comforting to know that the history of England was affected by a decision about the time of Easter. And if the ecclesiastical terms bother you, it is also comforting to think of the intricacies of the Egyptian or Mayan calendars. Altogether there are a thousand and one items of information (none of it necessary if you have an electric clock!) but fascinating, nevertheless. It is a grand book to pick up at moments—and fully as good as a detective story.—Carl Purington Rollins.

Camden (N. J.) Courier: Interesting as a novel is this collection of facts about the calendars of mankind from the earlier civilizations of Babylon, Egypt, Greece of old, and Julius Caesar and Mohammed. The ancients as a rule bogged down on what now is known as leap year and their calculations were preserved and served to upset those of later ages. Man from the "crack of dawn" tried to reckon time with some regularity. Among the most ancient of these is the Mayan stone.

The learned author tells of the battle that raged between the sun and the moon as an authority over the calendar, ending in the triumph of the solar year over the lunar month. He recalls how men have re-formed the calendar of many periods—how the Moslem prophet ordained a calendar for Islam, Omar Khayyam rearranged the Persian year; how Caesar created the Julian Calendar which held sway until Pope Gregory promulgated the Gregorian Calendar in 1577, accepted for three centuries by the Western World. The Jewish calendar, the ecclesiastical calendars with their "movable" feasts, the short-lived calendar of the French Revolution, the measures of time in ancient Mexico, China and India (where 14 calendars at present are in use), all are recounted with a detail at once instructive and entertaining.

"The Romance of the Calendar" concludes with a thorough consideration of the movement for reforming the present-day calendar and an explanation of the so-called World Calendar, with arguments in favor and against its adoption. The volume aptly is described as the first book of convenient size that surveys the development and the significance of the calendar as a whole. Recommended without reservation for the gaining of knowledge and pleasure in its reading. This book would be appreciated by both old and young—the learned and the groping.—C. J. N.

St. Louis Post-Dispatch: Sundial, clepsydra and sand-glass, precession of the equinoxes, chronometrical zones for daily time, the gyrations of the earth's axis—Mr. Wilson gathers all these within his book and makes a most readable story out of what might be dry statistics. He does a little special pleading for the proposed World Calendar, but he does it in a way that should be a model for argumentative persons of all eras. In fact, his book reveals more than the calendar. It reveals a gracious and scholarly gentleman as the author.—Marie Bliss.

Los Angeles Times: To the average man the matter of months and days seems as fixed as the laws of the Medes and Persians. But the calendar is in truth but a "charter of coincidence," says P. W. Wilson in his fascinating book. . . . The story of man's attempt to measure time is both fascinating and puzzling; it has lost none of its dramatic significance through Mr. Wilson's telling. Here is a most readable, informative, entertaining book, the first popular account of the evolution of the calendar.—Paul Jordan Smith.

Denver News: Man is set in the midst of time and space, and time is measured by the calendar. Next to the evolution of speech and of writing and printing, none of man's devices has had more to do with the development of his civilization than the calendar. . . . In this volume—clearly a labor of love reflecting the researches of many years—Mr. Wilson tells the story of the calendar, from the days when men marked the time by the phases of the moon, and the remote islands where they keep time by means of notched sticks, to the most elaborate contrivances of the astronomer's art and the current proposals for revision. . . . There is rich learning and interest in Mr. Wilson's Volume.—R. E.

San Antonio Express: Mr. Wilson, who served in the British Commons from 1906 to 1910 and now resides in New York, has written several excellent books. His "The

"Romance of the Calendar" stands out for its highly interesting treatment of a subject generally considered dry as dust. Mr. Wilson also has been notably successful in biography—as witness his Robert C. Ogden, George Peabody, William E. Geil and William Pitt, the Younger. "The Romance of the Calendar" dilates upon the world's many independent systems of noting time—but all are based upon the movements of the sun or the moon. . . . Mr. Wilson treats of many calendars—Jewish, Mohammedan and the proposed universal system, which would embrace four quarters of exactly 13 weeks. His book will appeal to scientist and layman alike.

Newark (N. J.) News: An injunction to "look at the calendar" is today so common that the calendar itself has slipped into the long list of accepted miracles, where the telephone, the radio and the electric light are beginning to feel quite at home.

But in an eminently readable book, P. W. Wilson shows with what difficulty our present yardsticks of time have been worked out and how far from perfection they still are. Astronomy, history, religion, poetry, mathematics, superstition, industry, accident, all have played their part in framing the innumerable calendars of mankind.

Cleveland Plain Dealer: The enthralling history of how man has measured time through the ages appears not to have been written before—at least, not in a single volume convenient for popular reading. Here we have an account of the ingenious and complicated calendars of the Aztecs, the Chinese, the Hindus; of the constant revisions and reformations of calendars—by Mohammed, by Omar Khayyam, by Julius Caesar, by Augustus, by Pope Gregory. And then there is a discussion of the proposed thirteen-month calendar, with seemingly insuperable objections to its adoption. And finally, an explanation of the so-called World Calendar, to which the objections do not seem insuperable. . . . The book is an immensely interesting volume, full of information and romance, and the adoption of The World Calendar may well be the next step to be taken in our quest for convenience and accuracy.

Minneapolis Journal: As long as there are people who like to delve into the past, there will be people interested in the changes wrought through centuries of man's desire to find a satisfactory way of measuring time. It is a curious thing that history shows—this constant sweeping away of one system which is in turn swept away and a new one crammed down the universal throat. P. W. Wilson has done the present volume, setting down in sequence the changes that have come from the time of the Babylonians, the early Egyptians, the Romans of Julius Caesar's time—all the way down to the present when there is appearing another lively movement to set all these at naught. The author is a journalist of parts and has written interestingly of a subject usually dealt with in a dry-as-dust fashion. Written for the layman, the book can still be read by the scientist without too much disagreement.

Buffalo Courier-Express: The idea that our present calendar might be altered with benefit to the everyday life of the world is viewed with alarm by those who hate to break dates, but as P. W. Wilson points out, the historical landscape is strewn with calendars which have been formed and reformed since the dawn of history. Only in the sixteenth century did January 1st become New Year's Day, and in India today there are 14 calendars in general use. "The Romance of the Calendar" is the first book of convenient size to delve into all the mystic and scientific lore connected with the significance and development of the calendar from antiquity to the present. The book concludes with a section devoted to a thorough examination of The World Calendar.

Vicksburg Post: Astronomers and mathematicians, archaeologists and churchmen have contributed to our knowledge of the many calendars by which man has measured time. But this is the first book of convenient size that surveys the development and the significance of the calendar as a whole. The author discloses the origins of the calendar from times of remotest antiquity and among peoples of every race, and relates with a wealth of fascinating lore, the fluctuations and conflicts that have marked its course. Today more than ever, the multiple activities of the world depend on continual appeals to the calendar. The Romance of the Calendar concludes with a thorough consideration of the movement for reforming our calendar and an explanation of the so-called World Calendar, with arguments in favor and against its adoption.

AS THE FAMILY VIEWS IT

By HELEN HULETT SEARL

OUR FAMILY, which has recently been "honored" by being selected through a local newspaper contest as the "average" or typical family in our community, sat in the living room after dinner, listening to a radio news commentator unfolding the latest news of the League of Nations' action on calendar reform. My husband, pipe in hand, had just found a dispatch regarding the same matter in his evening paper.

"Pretty interesting subject, this calendar reform," he remarked as the radio program came to an end.

Dick, the more-or-less grown-up son of the house, looked up from his High School home-work. "Think they'll put it over by 1939, dad?" he asked importantly.

"I certainly hope so. It'll make accounting easier," replied his father, who had spent the day trying to analyze the meaning of the quarterly figures of his business.

"What is calendar reform, Daddy?" demanded eleven-year-old Dorothy.

"Aw, you wouldn't understand it—women are such rabbits about figures," suggested Dick, teasingly.

"Of course she can understand it," defended their father. "It's just this, daughter. Thoughtful and clever people are waking up to the realization that the world as it is today needs a new calendar. They propose to make certain changes in the Gregorian Calendar which has been in use in many countries for over 300 years, changes that would bring it more in step with modern progress and make it acceptable to all the world."

"How funny! I thought everybody in the world used the same calendar."

"No, some use the Hebrew calendar, some the Mohammedan, some the one devised by Julius Caesar. But cable and radio and aviation have brought countries into such close touch that it would be a fine thing if they could agree on one calendar. It would make international business simpler."

"What changes do they want, Daddy?"

"The plan that appeals to most people is to divide the year into four quarters with 91 days—13 Sundays and 78 week-days in each quarter," began Mr. Smith.

"Oh, Daddy, don't go so fast," begged Dorothy.

"See! I told you it was too deep for you," jeered Dick.

"Quiet, please, Son," commanded their father. "I explained it very clumsily. Listen, Dorothy. Begin the year with Sunday, January 1. January will always begin on Sunday in The World Calendar. It will have 31 days. February will begin on Wednesday and will have 30 days instead of 28 or 29 as it does now. March will begin on Friday and will have

30 days. There's your pattern for the other three quarters of the year. The first month will have 31 days and the second and third months 30 days each. The first months will always begin on Sunday, the second months on Wednesday and the third months on Friday."

"Why is that better than now, Daddy?"

"Because in the first place it will give us uniform quarter divisions of the year. There will be 26 week-days in each month, the only difference being that the long months will have 5 Sundays while the short ones have 4. You will be able to tell without looking at a calendar what day of the week a certain day of the month will fall on. It will be the same every year and we won't have to figure forward and backward to find out. You can see the advantage in that, can't you?"

"Yes, I can. We're always figuring up to see what days the holidays come on. And because Labor Day came so late last year we'll have to be in school later in June. Tell me some more."

"Read this article. It explains it all very clearly. You'd like to read it too, Helen," he said to me.

I was deep in my household accounts. I looked up now with a tolerant smile. "A New World Calendar? I never saw anything like you men. You have positively no sentiment about things. Why, I'd as soon change my children's names as to change the calendar! What about anniversaries?"

"That would all work out. Most holidays would fall on Monday and give us long week-ends. As for anniversaries, my dear, I often hear you use the expression: It was so many years ago today by the day of the week that so and so was born or died or was married. So you see you do set some store by the day of the week in your memory book."

"But birthdays, John. Who wants to have his birthday changed?"

"No less a person than George Washington had his changed, and I never heard that it kept him from getting on in the world."

"Really, Daddy? How did that happen?" asked Dorothy.

"Well, Washington was born February 11 according to the calendar used in 1732. But in 1752 England decided at long last to adopt the Gregorian Calendar which had been in use in other countries for 170 years. The change necessitated dropping 11 days out of the calendar and Washington and his cherry tree had to be transplanted to February 22."

"I know a holiday we always celebrate on the same day of the week instead of the month. Thanksgiving!" cried Dorothy.

"Bright kid," patronized Dick. "But there's another you haven't thought of. Tell her about Easter, Dad."

"Yes, there's an example of a holiday not being celebrated on the day of the event it commemorates. The greatest holiday in Christendom. It wanders about in a space of 35 days and falls anywhere between March 22 and April 25. The new World Calendar would give us a fixed Easter."

I was listening to the talk with one eye on some letters that needed to be answered. Suddenly I gave vent to a groan of exasperation.

"What is it, Mother?" asked Dorothy.

"Oh, it's our club rummage sale for the Children's Home. We set the date for April 4 and now Mrs. Sims has discovered that April 4 comes on Monday. The hardest day in the week to get the women to work. We'll have to change the date and notify everybody all over again!"

"You'd better look into Calendar Reform, Helen," laughed my husband.

"But the new calendar wouldn't have enough days, and no extra one for Leap Year!" exclaimed Dorothy, who had been looking at the newspaper diagram of the proposed new plan.

"That's all fixed, Toots," explained Dick. "An extra day before New Year's every year and one between June and July every four years. Both holidays! Does that make me sore?" he chortled as he followed his father from the room for their customary evening game of checkers.

"A nice long letter from Margaret," I said to Dorothy. Margaret is the older daughter away in college. "You start to read it while I phone."

"Oh, Mother, Marg isn't coming home for Easter! Listen to what she writes," called Dorothy as I came back to the room. "'Easter comes so early this year that mid-semester exams have crowded out Easter holiday. We'll get a week later on . . .'"

Dorothy's face clouded. "I'll be back in school by the time she gets home," she complained. "Oh, Mother, isn't it terrible not to have her home for Easter and the Easter Monday dance?"

"And what on earth shall I do about her clothes?" I puzzled. "I certainly don't want her to buy them up there when we can do so much better here. But I don't want to buy them for her, she likes to select her own. And all the best things will be gone if we wait till after Easter!"

"Well, don't worry, Mother," comforted Dorothy. "Probably it'll be cold as Greenland on Easter. Say, Mother, didn't Daddy say something about the new World Calendar fixing Easter sometime in April?" She picked up the newspaper again. "Yes, here it is!"

"But, darling," interposed her mother, "I don't believe the Church would want the tradition of a movable Easter changed."

"Yes, they would, Mother. It says so right here . . . Oh, gee, look at that clock! I've got to dash to get dressed up for our club meeting tonight!"

When five minutes later she called, "Goodby, Mother," from the doorway, I looked up from perusal of the newspaper she had thrown down.

"Do you know there are the most interesting things here," I said. "It would make budgeting simpler and a lot of things that concern women. I'm going to read up on it and write a paper for the club."

"Atta girl, Mother," applauded Dorothy gaily. "We'll show 'em we women can be practical as well as sentimental! Goo'by!"

AS AN EDUCATOR SEES IT

By THOMAS SAMUEL McWILLIAMS

Late Professor, Comparative Religions, Western Reserve University

I WONDER if your reaction to the proposal to reform or simplify or improve our calendar is like my own?

Adhering to the principle that one scheme is not to be given up until a better one is devised, and thinking that the calendar fixed by Julius Caesar almost two millenniums ago, slightly modified by his adopted son, Augustus, in 8 B. C., and further altered by Pope Gregory XIII in 1582, had served us pretty well, I was impatient with all proposals to change it. I was weary of changes anyway. So many things that I had thought settled were being disturbed, so much time and energy and nervous force was being spent in making the adjustments, that I cried out, "Let the calendar alone!"

It was at the president of The World Calendar Association that I hurled this objection, during a holiday at Lake Placid some years ago. My friend patiently pointed out some of the awkward eccentricities of our calendar, with months varying from 28 to 31 days, its uneven quarter years and half years, the day of the month falling on one day of the week this year and another day next year, the peripatetic Easter, and the inconvenience, irritation and loss of time resulting from these things. Since that time, the successive issues of the Journal of Calendar Reform have fanned and fed the feeble flame of interest thus kindled. The result is that I have become convinced that over the centuries there has been an incalculable waste of time, money, energy and nervous force because of calendar defects. While still holding firmly to a principle that the present system is not to be given up till a better one is proposed, I have become convinced that The World Calendar is a better one. And that among several proposals which I have studied, it is the one offering the maximum of improvement with the minimum of change.

While realizing the tremendous power of mass inertia, ignorance and superstition, and the difficulty of getting world cooperation in anything, calendar simplification and improvement is so plainly needed and so clearly in everybody's interest, that I am hopeful the nations of the world will do something about it. I realize that to change the traditions of twenty centuries seems an appalling task. Certainly the faults of the present calendar will have to be made very clear, and it will be necessary to show that the substitution proposed will correct or at least lessen those faults without introducing others, and that the advantages will be worth any temporary confusions and inconveniences involved.

The indictment against our present calendar contains several counts.

First of all is the variation of 28 to 31 in the number of days in a month. How did this come about?

It was not quite so bad in the Julian calendar. Julius Caesar, the Mussolini of his time, decreed a calendar starting with January as a month of 31 days, February 30, March 31, etc., the 31-day months alternating with the 30-day months. But this made 366 days for the twelve months, so he decided to take one day off February every year for three years, thus making February a month of only 29 days. In the fourth year February was to be a month of thirty days.

Caesar's adopted son and successor tinkered with this scheme and messed it up considerably. He took one day from February and added it to August, his own name-month, and then readjusted the later months into the jumble which still exists.

Now these differences in the length of months, made in this case for trifling reasons of personal vanity, could be tolerated in the age of the horse and buggy, but they do not fit our age of motor cars, airplanes and electricity. They could be borne when business was a matter of barter between individuals, but they do not suit an age when international trade requires accuracy and comparability. Statistics of all kinds are rendered puzzling, irritating and inconclusive by the unnecessary variations in the number of days in a month. Some variations there must and will be, because of the obstacles that nature has set up. But we can so lessen and distribute these variations as to make them far less perplexing. At present they are so distributed that we have one half-year of 181 days and the other half-year of 184 days. We have one quarter-year of 90 days, another of 91, and two others of 92 each. We can have a year of four equal quarters and two equal halves, each quarter beginning with a month of 31 days, followed by two months of 30 days each. We can have quarter years with the same number of Sundays and the same number of weekdays each,—each quarter having 13 Sundays and 78 weekdays. Every human being, no matter what his occupation or status, will be convenienceed by this lessening and redistribution of irregularities.

A second fault of our present calendar comes from the eccentric incidence of holidays. Christmas always comes on December 25, but it falls a day later in the week each year, until leap year when it comes two days later. In the proposed calendar, December 25 is always Monday.

Easter is the most eccentric of all holidays. By the Council of Nice it was decreed that the Sunday to Commemorate Christ's resurrection should be "the first Sunday following the first full moon following the vernal equinox, March 21; but if the full moon fall on Sunday, Easter was to be celebrated on the next Sunday." Consequently this festival may come as early as March 22 or as late as April 25. In other words, there is a variation of 35 days in the date of its occurrence. And the dates of a whole series of other observances depend upon the date of Easter. In most churches, Easter is a pivotal festival, marking the culmination of the ecclesiastical year,—and the confusions and inconveniences in having the pivot of the whole church year so variable and peripatetic, are too obvious for elaboration. The World Calendar would stabilize Easter, fixing it upon April 8. This date is probably the actual anniversary of the event which it commemorates.

Easter also has an importance in schools and colleges. Any teacher who has served on a calendar committee and wrestled with the problem of making Easter and other holidays fall efficiently into the school year knows how difficult the problem is. The attempts at solution result in so many different patterns that to arrange meetings of teachers and officers of different institutions or sections is extremely difficult. Many American institutions have given up the attempt to arrange their work with refer-

ence to a peripatetic Easter, and observe a spring recess instead of an Easter vacation. Instead of members of the same family meeting at home for their spring recess, they often arrive and depart at different times. A minor matter, but an inconvenience, both stupid and unnecessary.

Another fault of our present calendar is the variation in the number of Saturdays and Sundays in the month. To compare a month having five Saturdays or Sundays with the same month in another year, having but four, is difficult for one requiring exact and comparable data.

My final count in the indictment against the present calendar is its uneven quarter and half-years. We now have the first quarter with 90 days, the second with 91 days, the third and fourth with 92 days each. We have the first six months or half year with 181 days and the second with 184 days. Obviously a comparison of quarterly figures will often be misleading. Comparison of half-years will also be widely in error.

Quarterly and semi-annual statistical comparisons are constantly demanded. It is obviously desirable to have the bases of these comparisons accurate; The World Calendar would give us equal quarter-years of 91 days and equal half-years of 182 days. All statistics would benefit.

Can these four faults of the present calendar be corrected? Look at the first fault—months of uneven length. It is not easy to eliminate this fault for the simple reason that 365 is not evenly divisible by 12. You can't have twelve months of the same number of days in a year of 365 days. Why can't we agree to have a year of 360 days which would be evenly divisible by 12? For the simple reason that a year of 360 days would not agree with the tropical or solar year. For the center of the sun to pass from one equinox to the same equinox requires not 360 days but 365 $\frac{1}{4}$ days. That stubborn fact we cannot change. Our word *year* comes from the Anglo Saxon "gear" and a 360-day year would throw us out of gear with nature. The seasons would come 5 $\frac{1}{4}$ days later each year, and in time January would come in summer instead of winter.

Why can't we agree to divide the year into 13 months instead of 12? That would give us all months of exactly the same number of days with one day and a fraction to be specially dealt with. Thirteen does not go into 364 just 28 times. This would correct the unequal length of the months. Such a 13-month year with 28 days has had a great many supporters. It would solve the unequal month difficulty very nicely. But such a solution of this one difficulty would give birth to other serious difficulties. In fact, it is obvious after a little consideration, that the 13-month plan would create more inconvenience than it would correct.

Thus we move to a consideration of the 12-month equal-quarter proposal. It offers us immense gains in simplicity and convenience, and in the accuracy and comparability of divisions within the year. It gives us a year which meets the requirements.

A great force was lost to our cultural life in the passing of Dr. Cadman. With the background of rich culture and varied experience in this and in other lands he was a true cosmopolite, at home alike in any assembly or any environment. One of the first to recognize the potentialities of the radio as a medium of culture, he brought to his work as a broadcaster the varied gifts which he possessed as a writer and thinker. Possibly no man of our generation for a longer period reached so great a number of hearers or brought to his radio audience greater sympathy and understanding. Simplicity and sincerity were the dominating traits of his character.

—Franklin D. Roosevelt.

Over all the barriers of prejudicial hatred that so bitterly divide the spirits of men, this great and tolerant man poured out his endless generosity of goodwill.

—Dr. Harry Emerson Fosdick.



THE LATE DR. S. PARKES CADMAN

Member of the American Advisory Committee of The World Calendar Association,
and of the Committee on Calendar Reform of the Universal Christian Council.

"I shall take opportunity again and again of referring to this matter because I have realized its vast importance, not only for religion but for the whole world and the world's trade and commerce."

RECENT CHURCH ACTION

By DR. HENRY SMITH LEIPER

American Executive Secretary, Universal Christian Council

(From *The Churchman*)

READERS of *The Churchman* will be interested to learn that at its regular biennial meeting, held last summer, at Chamby, Switzerland, the Universal Christian Council for Life and Work, passed a resolution endorsing a stabilized Easter and approving calendar reform provided "it is based on the perpetual 12-month equal-quarter plan." This decision, reached after an intensive four-year study of the subject, undertaken by its Research Department, follows:

"Whereas the Universal Christian Council at its Eisenach meeting in 1929 expressed its desire for a careful study of calendar reform and Easter stabilization; and whereas the council in 1932 instituted an intensive study of these subjects by its research department; and whereas these studies and reports from the churches have shown that a reform of the calendar and the stabilization of Easter would, if carried through, receive the support of the overwhelming majority of the churches, providing it is based upon the perpetual twelve-month equal-quarter plan proposed by the League of Nations: Therefore be it Resolved that the Universal Christian Council instructs its Standing Committee on Calendar Reform, to notify the secretary general of the League of Nations concerning the above report and to secure the most effective presentation of this action of the churches at the forthcoming world conference on reform and the stabilization of Easter and finally that this council asks the churches to inform their respective Governments of this action and of their views with regard to the desirability of adopting the new calendar."

The Universal Christian Council, with headquarters at Geneva, is a world federation of non-Roman churches and embraces all major Orthodox, Anglican, and Protestant bodies throughout the world. At its head are four presidents: Dr. William A. Brown, representing the American Section; the Bishop of Chichester representing the Archbishop of Canterbury

EDITOR'S NOTE.—A large part of the credit for the rapid progress made by calendar reform in the Universal Christian Council should go to the late Dr. S. Parkes Cadman, Honorary Moderator of the Congregational and Christian Churches, chairman of the American Section of the Universal Christian Council and one of the presidents of the Council itself. Bishop William T. Manning wrote in the October, 1936, issue of the JOURNAL OF CALENDAR REFORM: "The subject came to Dr. Cadman's attention with the early activities of the League of Nations which sought to bring about an agreement on this matter between religious and civil authorities. From the beginning, he was a consistent and devoted advocate of revision, supporting the League of Nations program for securing a definite commitment from all the church bodies throughout the world. It was his recommendation that was largely influential in inducing the Universal Christian Council to undertake a four-year study of calendar reform. This study progressed until in 1935 the world churches were ready to appoint a standing committee 'authorized to communicate with governments and with influential groups for the purpose of advancing the cause of calendar reform.' A year after the formation of this committee under Dr. Cadman's leadership, the American churches completed a study of calendar reform, bringing matters to the point where he could address a memorial to the President of the United States and the Secretary of State, signed by a special committee of the American churches, explaining officially their attitude. Dr. Cadman's far-seeing, vigorous and tactful leadership was visible throughout the gradual development of the calendar reform movement in the vast arena of church government." He was a friend of Roman Catholic, Jew and every branch of Protestantism. His broadness and depth of character made him realize the value of an improved all-round calendar for the general use of men. The World Calendar with its order, balance and equality, with its perfect synchronization of the various time units, he visioned as the practical and ideal calendar of a new age, a calendar which the religious, scientific and civil world could use simultaneously. He saw in it an instrument whereby nations, religions and peoples could come closer together in friendship and cooperation through the mutual use of one uniform time-system throughout the world.

and the Anglican Church; and Archbishop Germanos, representing the Eastern Orthodox Church. The fourth president, Bishop Ammundsen of Denmark, who represented the Continental churches, died in December, 1936, and his successor has not as yet been chosen.

The official action at Chamby in favor of calendar reform has an interesting background. As early as 1900, non-Roman churches at an Evangelical conference at Eisenach took up the proposal for calendar reform. A considerable time intervened without action. Then in 1929 (again at Eisenach) the question of reforming the calendar was brought to the attention of the Universal Christian Council and a resolution was passed in which it declared its willingness to participate in a careful study of the question whenever the appropriate time might appear to have arrived. Three years later the study was begun, it having become known that the League of Nations would question religious authorities on their attitude toward a fixed Easter, upon which matter the League in its "Easter Act" had made an official pronouncement from a purely secular standpoint. The league, in its official request, made it very clear that the ultimate decision and final action rested with religious authorities. At no time did the league attempt to impose the Easter Act upon the churches. A similar questionnaire by the League was also sent to the various member and non-member nations. To this, 26 governments (among them the United States of America) responded in favor of a fixed Easter, fully realizing, however, that upon this question the final verdict lay with the churches. Since that time there has been recorded with the President and Secretary of State the report of action taken by American church bodies endorsing the fixed Easter and indicating the predominant preference for the perpetual 12-month equal-quarter plan of calendar reform.

It is significant to note that the Universal Christian Council went a step farther than the League in the study of the whole question, insofar that it recognized the fact that no fixed Easter could be obtained without at the same time securing a perpetual calendar. (By perpetual is meant that every year is the same.) For, obviously, with our present changeable calendar, a "fixed" Easter would still wander, although its "wanderings" would be limited to 7 days instead of 35.

Churches in their desire for a fixed Easter are fully aware that a universally observed Easter on an identical date throughout the Christian world would promote a unity among Christian churches by having the already universal celebration of Easter come on the same day instead of differing days as at present. The annoying and quite unnecessary difficulties that arise for both church and parish life by the varying Easter (and the feast days in relation to it) often react inconveniently and discouragingly upon those seeking church unity as well as upon certain world-wide social

and business activities. In both ecclesiastical and fiscal calendars as now constructed, there is the additional disadvantage that confusion inevitably arises when Easter falls either in April or in March. For example, with Easter coming on March 28, in 1937, and on April 17, in 1938, it would mean that in certain budgets and reports, which begin their tabulations with April 1, there would appear no Easter at all for 1937-1938.

As was anticipated, the churches by an overwhelming majority were in accord in their affirmative attitude to the question regarding the League Easter Act, sent to them through the Universal Christian Council. They agreed first, that objections of a fundamental nature to a stabilized Easter could not reasonably be raised on theological grounds, and second, that the overwhelming majority of churches through their representatives or by official action approved the stabilization of Easter, provided agreement among the Christian churches on the question could be reached. In the perpetual 12-month revision of equal quarters, the Easter date is fixed for April 8, as it falls nearest to the historical date. It is a fortunate date as it does not conflict with other feast days of importance.

After securing and formulating an authoritative opinion regarding a fixed Easter, there arose the necessity to consider a revised calendar in its entirety. The Universal Christian Council believed it was "urgently desirable that the churches should be clear in their minds concerning their attitude to the two major plans proposed before the League of Nations in order to reinforce and strengthen their recommendations and suggestions to the League of Nations." The report stated in general terms that an unchangeable fixed calendar is as beneficial to the religious life as it is to the civil life. The church calendars, with their important feast days, and business activities, wage payments, social engagements and school vacations, among other pursuits, are all closely bound up with the calendar. Therefore, to achieve an unchangeable and perpetual calendar, upon which man everywhere and in all nations can base his various endeavors, is essential and helpful, if he is to enjoy a greater sense of stability and order, not only in his time-measurement, but in his daily living.

The two plans proposed by the League of Nations for consideration were carefully and impartially studied, upon the ground that it would be helpful to all walks in life to have stabilization of the calendar, and thus would add to the unity of the spiritual relations between the Eastern and Western churches.

Questionnaires were sent out by the Research Department of the Universal Christian Council with literature that included material in advocacy of both the 13-equal-month, and the 12-month equal-quarter plans in order to ascertain the churches' opinion on the matter. No discrimination or partiality was shown. The answers to the questionnaires revealed, how-

ever, an overwhelming approval of the perpetual 12-month equal-quarter calendar, as it does not disturb the familiar fixed festivals.

The perpetual calendar favored by the churches has twelve months, 3 months to each quarter, of which the first month has 31 days, the other two 30 days each. It would have a Year-End Day inserted at the end of each year just preceding New Year's Day. According to some churches this day might well be observed as a "Universal Day of Rest," dedicated to encouraging a spirit of unity and peace among all nations. In leap years, another day would be inserted in mid-year, called Leap-Year Day.

It is of interest to note that the first church which took any definite stand on the question was the Eastern Orthodox Church. Through its official representative it advocated a fixed Easter date and supported a revision of the calendar on the 12-month equal-quarter plan in 1931. In America, the Protestant Episcopal Church, the Methodist Episcopal Church South and the American Lutheran Church have clearly spoken in favor of both the fixed Easter and calendar reforms on the same revision. Other churches are on record as in favor of the Easter date and are pursuing studies regarding a particular plan of calendar revision.

In the Roman Catholic Church, the Abbot of Farnborough, England, foremost liturgical scholar, the Abbé Chauve-Bertrand of France, acknowledged Catholic authority on the subject, Father Panzarasa of South America, and Father Schwegler of the United States are among the outstanding advocates of the 12-month revision, known as The World Calendar.

For the first time, perhaps, in history, there is a movement which affects every phase of man's life both in the secular and religious world:—in which dogma does not enter, polities plays no part, and national differences are not recognized. It is a world-wide movement that in its effort toward obtaining one unified calendar exerts a notable influence toward unity, and through universal agreement may pave the way to mutual interest, respect and cooperation on other concerns which affect nations.

OBITUARY NOTES

ADMIRAL RICHMOND PEARSON HOBSON, President of the World Narcotic Defense Association, died March 16. An active member of The World Calendar Association since its organization, he spoke frequently for the reform. "I consider the purpose of The World Calendar Association," he said, "to be of importance as wide as the world and as deep as the life of humanity."

THE RIGHT REVEREND ROBERT WESTLY PEACH, Presiding Bishop of the Reformed Episcopal Church, died on December 23. Bishop Peach had long been interested in calendar reform.

PEYTON BOSWELL, editor of *The Art Digest*, died on December 18. An enthusiastic advocate of calendar reform, he had been a member of The World Calendar Association since 1932.

OTHER deaths among the membership of The World Calendar Association during the past few months include Arthur Brisbane, newspaper editor, and Thomas McWilliams, professor of religion at Western Reserve University.

CANADA ALIVE TO REFORM

By J. MURRAY MUIR

Secretary, Rational Calendar Association of Canada

WITH the increasing use of motor vehicles, Canadian provincial and municipal governing bodies, some years ago, launched a planned program of improved roads and highways.

Reference to maps of the early roads of Lower and Upper Canada will show that these roads followed their leisure way as dictated by property boundaries, existing ground formation, the paths worn by the pioneer settlers and, if we go far enough back, perhaps by the seasonal movements of the Indians. Unexpected curves and turns, sudden rises and swift descents were characteristic, although to the travelers of the horse-and-buggy days these roads were as satisfactory as they were picturesque.

The advent of the more rapidly moving automobile and the increasing use of the country's interurban highways made the shortcomings of the early roads all too apparent. Recognizing the changing needs, roadbuilders laid out the improved highways with a view to making travel not only safe but convenient. Sudden turns were straightened, sharp hills eliminated and, where it became necessary, entirely new roads were built.

This program of improved highways is still progressing and the same objective of convenience is being followed. In short, with a new era in transportation has come a new practice in road and highway design.

In 1752, Great Britain and America officially adopted the Gregorian Calendar which had been in existence some 170 years prior, even, to that time. The Gregorian Calendar of 1582, accordingly, has been the same pathway of time along which Canadians, in company with the people of most of the other countries of the world have, ever since, continued to trace their variable, and, in comparison with changing conditions, antiquated calendar way.

In October, 1931, Canada, together with official representatives of forty-three other countries, met at Geneva under the auspices of the League of Nations to discuss the pros and cons of calendar reform which, by then, had boiled down to two alternatives, the 12-month, equal-quarter calendar, and the 13-month calendar. In the reports of this meeting, duly published in the daily papers, Canadians read with interest that Canada and Jugoslavia had registered official approval of a scheme of reform whereby "Sol" would join the twelve long familiar months of the year in the measurement of the passing days. In other words, when and if the rest of the world adopted the 13-month proposal, Canadians would be at liberty to take pride in the fact that they and the Jugoslavians had set the pace in calendar reform. As they read further down the page, however, a shadow

of doubt and wonder may have crept into their minds as they noted that of the other forty-three countries represented at that Geneva meeting, ten, including Great Britain, registered disapproval of the 13-month scheme, two came straight out for the 12-month equal-quarter calendar, and the rest, like Brer Rabbit, said nothing for publication.

What actuated this stand taken by Canada's representative may, in the years to come, be publicly revealed. It has been suggested, however, that the endorsement of the 13-month scheme was due to an unfortunate misunderstanding of the extent of international agreement on such a plan.

Up to that time, Canada had, generally speaking, shown little interest and concern in the subject of Calendar Reform. Those who were giving the matter any thought were largely of a scientific turn of mind or engaged in actuarial or accounting work. There was no organized interchange of Canadian thought and opinion, and the Canadian Government had certainly made no apparent efforts to obtain or encourage the expression of public opinion that marked the policy of the British Government in connection with the same question.

In 1934 the Rational Calendar Association of Canada had its inception with Erland Echlin as its secretary, a well-known and able Toronto journalist who has since moved to England but continues his deep interest in The World Calendar movement. During the two years which have elapsed since the formation of the Canadian Association, the membership has steadily grown. Today it numbers well over five hundred and embraces men and women in all parts of the Dominion and representing practically every calling and profession in Canadian life.

When formed, the Association named as its objects:

To secure withdrawal of Canada's official endorsement, at Geneva, in 1931, of a 13-month calendar.

To advocate the world-wide adoption of a rational perpetual 12-month, equal-quarter calendar.

To inform public opinion on the defects and inefficiencies of the calendar now in use.

To promote the adoption of a stabilized Easter along the lines of the British Parliamentary Act of 1928.

That the appeal of the 12-month equal-quarter calendar is sound and that the work of the Association apparently has not fallen on barren ground is indicated by the ever-growing Canadian interest, as well as by the increasing acknowledgment of the simplicity in reform provided by The World Calendar. Bearing out this point, several Canadian editorial references to the subject might here be quoted:

In the *Canadian Churchman*, a weekly periodical of the Anglican Church, we find a modern note that is in keeping with reform: "It will be our duty to 'snap into' the new calendar just as quickly and as thoroughly as we possibly can." Definite preference for the 12-month equal-

quarter plan is noted by the *New Outlook*, of the United Church of Canada: "In all leading countries, students of calendar revision are convinced that the advantages of the 12-month plan outweigh the advantages of the 13-month plan." In the *Packet and Times*, of Orillia, Ont., similar endorsement is expressed: "Calendar reform would gain so many advantages, and, as far as the twelve-month equal-quarter year is concerned, is so comparatively simple and easy to carry out that it will be a pity if the League is unable to get the necessary support." The *Nugget*, North Bay, Ont., says: "Our present calendar system has merits, but it is not without fault. The proposed World Calendar seems to overcome the chief objection to the present, or Gregorian Calendar, the fact that it cannot be divided for comparison into periods with the same number of days."

What Canada's official position will be at Geneva this year, remains to be seen. If the previous official stand was, as it has been suggested, the result of a misunderstanding, and if the increasing preference (to the corresponding exclusion of the 13-month proposal) is any indication, Canada will be definitely behind The World Calendar.

That Canada should be a live factor in reform of time measurement is, incidentally, in keeping with past history, for it was the internationally known Canadian engineer and astronomer, Sir Sandford Fleming, who, in 1878, introduced the scheme whereby Standard Time was adopted throughout the world, zoned at one-hour intervals from Greenwich.

Not the least important of the advantages of a 12-month equal-quarter calendar to Canadians is the stabilization of public holidays. As the following list indicates, the majority of the public holidays will, with The World Calendar, fall on days which will not only provide long week-ends, but also tend to eliminate the disrupting effects of mid-week holidays:

January	1st	Sunday	New Year's Day
April	8th	Sunday	Easter
May	24th	Friday	Victoria Day
July	1st	Sunday	Dominion Day
September	4th	Monday	Labor Day
October	16th	Monday	Thanksgiving Day
November	11th	Saturday	Remembrance Day
December	14th	Thursday	King's Birthday
December	25th	Monday	Christmas

As 1939 approaches and the new calendar, if adopted, is introduced, it is safe to predict that Canada will not be behind the rest of the world in appreciating the needs for reform and the many advantages to be derived therefrom. Canadians are, from their British up-bringing, fundamentally conservative in nature. They are, however, always alive to the demands of progress, and when the time comes they will be among the first to seize on the benefits that calendar reform in general and The World Calendar in particular, will provide.

EASTER AND CHURCH FINANCE

By H. W. BEARCE

National Bureau of Standards, U. S. Department of Commerce

THE ordinary calendar year contains 365 days, or 52 weeks plus 1 day, while leap year contains 366 days, or 52 weeks plus 2 days. Thus, while the normal year may be said to contain 52 Sundays, it is clear that an ordinary year beginning on Sunday, or a leap year beginning on either Saturday or Sunday will contain 53 Sundays.

Since church contributions and pledges are usually on the basis of so much per Sunday, it is clear that a 53 Sunday year is advantageous from the standpoint of church finances, as the extra Sunday may be expected to provide increased receipts of nearly 2 per cent of the normal yearly income. This increase is not offset by increased expenses, since salaries, interest, and other major expenses are usually paid on a yearly basis, without regard to the number of Sundays in the year. In a large church this increase might readily amount to several hundreds of dollars.

The fiscal year of many churches, instead of coinciding with the calendar year, begins on April 1st and ends on March 31st. In such cases the same rule applies, that is, the church year contains 53 Sundays or 52 Sundays depending upon whether it happens to begin on Sunday, or on some other day of the week. A church year beginning on April 1st just prior to a leap year, that is, a church year containing February of a leap year, will contain 53 Sundays if the church year begins on either Saturday or Sunday. If it begins on any other day of the week it will contain but 52 Sundays even though it contain February of a leap year.

Another factor which seriously complicates church accounting is the variable date of Easter. A normal church year might be expected to contain 1 Easter, but since Easter may fall on any date from March 22 to April 25, both dates inclusive, it is evident that a church year, April 1 to March 31, may contain 1 Easter, 2 Easters, or no Easter at all. Thus, a church year may vary from a 52 Sunday year with no Easter, to a 53 Sunday year with 2 Easters. This wide variability, from the financial standpoint, is very disturbing. Obviously, the receipts for a 52 Sunday year with no Easter will suffer in comparison with receipts for a 53 Sunday year containing either 1 Easter or 2 Easters.

That such a series of non-comparable years is not merely a theoretical possibility, but a common experience, is shown by an examination of the calendar for recent years. Such a series of years occurred between 1927 and 1930, another between 1931 and 1934, and one is now occurring in the period 1935 to 1938.

The church year April 1st, 1927, to March 31, 1928, contained 52 Sundays, including 1 Easter which fell on April 17, 1927. The year April 1st, 1928, to March 31, 1929, contained 53 Sundays, including 2 Easters; April 8, 1928, and March 31, 1929. The year April 1st, 1929, to March 31, 1930, contained 52 Sundays, but no Easter. A direct or "unadjusted" comparison of receipts for these three years would not give a true picture of the financial condition of the church over the three-year period. Conclusions based on such a comparison would be analogous to the not uncommon conclusion that hens lay fewer eggs, and cows give less milk in February than in January or March. They undoubtedly do, because February is a short month; but when calculated on the basis of average daily output the apparent differences largely disappear.

The reason for the financial importance of Easter, to the church, is, of course, that many persons attend church services, and contribute to the church only on that day. While the spiritual benefit of such attendance, either to the church or to the individual, may be open to question, the financial benefit to the church is not inconsiderable.

A plan has been proposed for revising our Gregorian calendar in such a way that the year would always begin on the same day of the week, preferably Sunday, and that Easter would always fall on the same day of the month, preferably on the second Sunday in April. Under the most favored plan, Easter would fall on April 8. Under this plan, which in this country is known as The World Calendar Plan, the calendar would be perpetual; that is, January 1 would always fall on Sunday. April 1 would also fall on Sunday and the year would always contain 52 Sundays. Each quarter of the year would contain 3 months, the first containing 31 days, including 5 Sundays, and the other two containing 30 days each, with 4 Sundays. Thus the year would contain 12 months, arranged to form 2 equal halves, and 4 equal quarters, each quarter containing 13 complete weeks, and thus 13 Sundays.

Such a calendar would differ little from our present calendar except that it would be perpetual, symmetrical, and convenient. Under such a calendar, church and school programs, and other meetings, could be scheduled in advance with convenience and accuracy; statistics from month to month, and from year to year, would be more directly comparable than at present; and many other calendar difficulties which we now encounter would be eliminated.

I commend The World Calendar, 12 month, equal quarter plan, not only to the churches, but to the schools, to business, and to all other groups and individuals who use the calendar, and who have an interest in its improvement.

INTERCALARY COMMENTARY

By RABBI MARTIN M. WEITZ

Director *Hillel Foundation, Northwestern University*

The Hebrew calendar has evolved from cycles of change. Its life and growth has involved three major calendric constructions, developing into a system based on calculation rather than observation. It has lived through semi-solar, semi-lunar and semi-solar-lunar exposures. It has held sway over the lives and cultural legacies of Judaism for 3000 years. In this article a distinguished Jewish scholar discusses the official "commentaries on intercalation" which have constituted so large a part of Jewish literature during the past 1000 years.

ARARE old volume may be a great treasure. Some years ago such a book came into my hands—one I have found of immense interest. It is entitled *The Intercalation of Years*, and it was written by one who calls himself Issac Treves. The date of the book is 1579 and it appeared in Venice.

The volume contains 137 pages. It includes four kinds of paper and the cover is "water marked" with an imprint of "moths." On the fly leaf appears the imprint of the ecclesiastical censor and despite pagination by a later hand, the book is in its original form and is thus proof of the reverence accorded to the calendar by an author of the sixteenth century. It opens with elaborate ornamentation within which appears a poem that is also a prayer.

The book is chock full of Biblical allusions to time and Talmudic references to intercalation. There are vigorous and apocalyptic predictions, cabalistic circles and graphs, with glorified gossip that has been sublimated into the cosmic sphere and expressed in the Hebrew, Aramaic, Latin and Greek languages. There is a chart of Scriptural selections for weekly reading, parallel to the Sabbaths and festivals of the calendar, with choice literary and ethical selections, and calendrical cycles embellished with astrological forecasts for generations to come. Nor must we forget the reckoning of intercalations of seven months every 19 years of the Jewish Calendar and much other illustrative material.

I like to think of this book of mine as an island of specific record within the age-long stream of Jewish experience. Geographically, the Venice of the sixteenth century, when the book appeared, lay between the Saracenic East and the Christian West. Chronologically, the book is a link between five centuries of previous development of the calendar and four centuries of development still to come. As I turn over its mediaeval pages I am tempted to embark, therefore, upon a rediscovery of a millennium of Hebrew commentary on the measurement of time wherein this book stands

as it were in a midway position between the earlier and later periods.

A calendar is a systematic arrangement of the days of the year. The Hebrew calendar has been evolving for well over three millenia. Its general evolution embraces three calendric constructions—semi-solar, semi-lunar and semi-solar-lunar, the whole of which means that the calendar arose out of three chronometrical systems, Egyptian, Babylonian and Semitic. Through countless centuries, it has influenced the lives and literature, the feasts and fasts of Judaism and Jewry. It is thus the only great lunar-solar calendar that today contributes religious and historical significance to the culture of a widespread people in the modern world.

The Jewish Calendar, unlike the Gregorian, is based on days reckoned from evening to evening. The day begins at dusk with the appearance in the sky of three stars of the second magnitude. The moment when night begins is important to Hebrew observances. For at that moment commence the Sabbaths, festivals, feasts and fasts. On the other hand, the interlude between daylight and darkness varies according to season and locality. Hence, this moment is no longer determined by continuous observation as in ancient days but by systematic calculation. The Hebrew day, varying in length, is divided into 24 equal hours. The night is divided into the four *watches*, as suggested in Biblical and Talmudic readings. The hour contains 24 *onot*. Each *onot* is divided into 24 *ittot* and each *ittot* into 24 *regaim* or seconds.

Within the last thousand years, the Hebrew Calendar has been a subject of at least a hundred important commentaries. I cannot attempt to call the whole of this roll of honor, but I may mention a few of Israel's greatest contributors to the historic "time-line"—men whose lives can be disentangled from over-speculation and mythmaking.

We pass over Mashallah (754-813 C.E.), Sahl ben Rabban al Tabari (786-845), Sind ben Ali (829-932), Shabbetai ben Abraham Donolo (949-?) and Hasan of Cordova (972-?), in favor of a Karaite writer and philosopher, Sahl ben Mazliach ha Kohen al-Mu Allim Abu Al Sari. This evangelist-heretic lived a good portion of his life in Jerusalem during the tenth century, and labored for Karaism, a semi-decadent movement which stressed the "strict construction" of the "constitution," the Torah. He knew his Bible thoroughly, was well versed in Arabic and was an unyielding foe of Saadiah, Israel's great luminary of the time. Apart from his advocacy of Karaism, he has rendered services of great value in clarifying terms of calendation and calendric issues. We owe to him a pungent review of a controversy between Rab Meyer of Jerusalem and Saadiah of Babylon over the question whether observation rather than calculation is the better method for Jewry in Palestine. His correspondence is useful as a guide to differing observances of the calendar in the various Jewries of the world.

During the twelfth century, there were twin stars in the Jewish firma-

ment. The first was a "man of many names," Abraham ben Hiyya, who died in 1136, a year after the birth of the great Maimonides, his fellow countryman in Spain. "Governor of a city," Savasarda, Abraham Judaeus and other titles were used to distinguish ben Hiyya as a gentleman and scholar from Barcelona and Toulouse. Many authorities identify him with Magister Abraham who developed the treatise *De Astrolabio* for Rudolph de Burges. He was conspicuous as a commentator on the calendar.

Works of Abraham Judaeus include his *Treatise on Geometry*, a celebrated statement translated in 1116 by Plato of Tivoli; his *Form of the Earth*, an astronomical-astrological interpretation of the processes and purposes of heaven and earth (the volume was translated several times into Latin and French); his *Calculation of the Course of the Stars*, a sequel to the preceding volume which has been recovered in manuscript with many additions by Ibn Ezra; his *Tables of Al Battanai*, so named from an Arabic source-work; his *Book of Intercalation*, the oldest available Hebrew work dealing with the calculation of the calendar (which served as source-material for the Venetian volume mentioned earlier in our discussion); his *Scroll the Revealer*, an exposition that the Messiah would appear in the year 5118, according to Hebrew reckoning, or 1358, according to the Christian Era. This last treatise summarizes his work. He opposed superstition, but declined to be diverted from Messianic weather-vanes.

The second of these commentators on the calendar was Abraham Ibn Ezra. He was "the wandering Jew" of his period. Born at Toledo in 1092-3, he fulfilled a span of 75 years, fleeing to Rome from the scene of a son's conversion, meditating on philosophy in London, extending his studies in Bagdad and facing sorrows in Calaborra. He traveled in Spain, Italy, North Africa, Palestine, Egypt and, according to one tradition, he reached India. Wherever he wandered, he wondered, laboring over some new work whether it be on the *Names of God*, or *Astronomical Calculations*. His contributions to the calendar included: a translation of an astronomical work from the Arabic, *Secret of the Teacher*; also a *Book of Pure Speech*, in which he included calendation. Of significant calendric value are his works on mathematics, astrology and astronomy, which display versatility of learning and a soft-sweeping Hebrew style. We have the *Book of One*, an intriguing statement on the properties of numbers one through nine; *A Book of Numbers*, a concise summary of arithmetic; *Tablets*, an astronomical work with charts and with some critical commentary; *A Book on Intercalation*, which, as the similarly named volume by Abraham Judaeus, may be source material for our Venetian-created, censor-imprinted, Bible-quoting volume of 1579. Also, there is a work on the astrolabe; *Three Questions* in answer to chronological difficulties; and two translations of works by an earlier astrologer, Mashallah.

Not only was Abraham Ibn Ezra to be reckoned among the great cre-

ators of Jewish literature. Like Abraham Judaeus, he was an intermediary between Arabic and Christian cultures in the period that lay between the Crusades and the Renaissance. In that sense, these authorities on the Jewish Calendar were among the international minds of their day.

Issac ben Joseph Israeli, the younger, was a Spanish astronomer of the early fourteenth century. A pupil of Asher ben Jehiel, he wrote a famous astrological volume, *Secret of the World*, which by many is considered to be the finest contribution on an astronomical subject in the entire range of Hebrew literature. It was first published in 1777, but had been much studied in the Middle Ages when associated with an anonymous commentary that had somehow grown around it. This treatise proceeds from introductory geometry and trigonometry to the structure and movement of the earth, its relation to the celestial spheres, its differentiation of day and night from various points on the globe, the position of sun and moon and their relation to the seasonal solstices, neomenial eclipses and leap years, as well as astronomical graphs, chronological systems of calendation. Also, we have a chronological blueprint of noteworthy figures in the life of Jewish history. Much of the volume, especially an abridgment compiled by Israeli's son, found its way into Arabic and other writings, for instance our Venetian volume.

At the universities of Salamanca and Saragossa, there was an astronomer called Abraham ben Zacuto. In the very year 1492 when Columbus discovered America, he was serving as Court astronomer and historiographer for John II of Spain and Don Emanuel of Portugal. That was a year when Spanish Israel suffered exile, and in this case exile led to scientific discovery. Ben Zacuto was the maker of an astrolabe of iron instead of wood, which Vasco da Gama carried on his famous expedition. He wrote a chronological history of Jewry from the Creation to 1500. Even during his flights from persecution and in his periods of incarceration he sought the stars and charted their courses. All his writing is interwoven with the sadness of constant exile relieved by serious search of the hope-illumined heavens. He attempted to distill eternal verities from the celestial stardust and in his summation of calendric and personal experiences, he sought to see truth not as a half but as a whole. His *Commentary on Calendars* was elaborated into an *Almanac Perpetuum* by Joseph Vecinho; his work on *Merit* lived in manuscript for centuries as did many of his lesser known treatises on astrology and astronomy. His writings were overwhelmed, however, by the universe on which he meditated. He attempted to encompass a whole cosmos in his calculations and his utmost estimates were surpassed by the gigantic infinities of later figures and facts.

Another great commentator on the calendar is the Polish Rabbi, codifier and philosopher, Moses ben Israel Isserles. We need not here dwell upon his life in Cracow, where he was born in 1520, his studies in Lublin nor

his academy in his native city. Neither are we to consider his many works of general and specific Jewish value. It is of interest, however, to recall that Isserles and his fellow student Solomon Luria were similar in their pursuit of truth and their ascription of importance to custom. Luria was concerned with intuition whereas Isserles based many of his conclusions upon Aristotle. It was Isserles who said that secular science was a fit subject of study, if it does not lead one to heresy. We do not have much about the calendar from his hand but in what he did write, he was free from hair-splitting argument and heavy traditionalism.

A friend of Kepler's and Tycho Brahe's, a German historian as well as astronomer and a student of Isserles, was David Ganz, who was introduced to Rabbinic studies in Frankfort-am-Main and continued them in Prague and other centers where he developed his interest in astronomy and mathematics. He worked out a treatise called *Limits of the Earth*, an ambitious work on cosmography which may be identical with another work published at Constantinople under the name of David Avzi (i.e., "Ganz"). Also there are his *Star of David*, an astronomical "time-table" on Hebrew calendation; three mathematical treatises which are no longer extant; and *Desirable and Sweet*. This work on astronomy and geography follows the Ptolemaic school regardless of his knowledge of the new Copernican theory which he attributed to the Pythagoreans of a long vanished past.

Raphael Levi Hannover was a "boy scholar" trained at Frankfort-am-Main. During his early years he was an employee in the house of Oppenheim and a most faithful disciple of Leibnitz. In later years we find him teaching astronomy, mathematics and philosophy; also, a writer of at least two volumes of calendric merit: *Tables of Intercalation*; and *Foundations of the Heavens*, an ambitious outline on the significance of astronomy and calendar construction with apt selections from Talmudic sources elaborating these two motifs.

Next on our "Time-line of honor" is Israel Lyons, a prodigious student of botany, mathematics, astronomy, a lecturer at Oxford at the behest of the Royal Society and an outstanding member of Capt. Phipp's Polar Expedition in 1773. His efforts of calendric significance include a *Treatise on Fluxions*, and are concerned with general rather than Jewish calendation. A final name to add to the list of authorities is our Twentieth Century contemporary, Julian Morgenstern, now president of the Hebrew Union College, and author of a series of calendar studies.

In nearly all of the accessible volumes under our survey of Jewish comment on the calendar over the last thousand years, we find certain expressions—for instance, to take the earliest, "the fixation of the month," "the sanctification of the new moon," "the sanctification of the new moon by observation," "the sanctification of the new moon by means of reckoning," "the science of the fixing of the month," "the secret of intercalation"

and "calendation." Later nomenclature includes "the baraita of the secret of intercalation" and the "baraita of Rad Ada," which is another term for the *Pirke (Sections) of Rabbi Eleazer Hagodal Ben Hyrcanus*, which work is quoted in no fewer than a dozen pages in our "guiding" Venetian volume. Sufficient for our purpose is it to know that all of the above terms apply to a bound lunar year, which was appended with Babylonian names and which emerged as Calender III, from two earlier calendric systems.

Sacred occasions have a variety of names in the Venetian volume of 1579 and in all the other calendric "workbooks." The Sabbath as well as preceding and following days of festivals are examples. Such include "Eve of Passover," "Eve of Tabernacles," and many of the Sabbaths outside of festivals, as Sabbath of Genesis, so named after the Bible reading for that day.

In some instances, recollective of Hebrew lunar calendation, the fourteenth or fifteenth day of the month is also cited as a Sabbath. According to Pincus, the fifteenth day of Nisam, a Sabbath in Biblical sources, was known as Shappata in Babylonian sources. The seventh day, however, since Israel's earliest times, must have been the same kind of a day that it was to later commentators, since the sacredness of the number seven and other factors have preserved many of the features intact. Thus the age of the name Sabbath as well as the number seven serve as protective walls between which flows the stream of later laws and still later commentaries.

In the lunar month cycle, the seventh month is of special sanctity. It is enhanced with much appeal to ear and eye, as the blowing of trumpets and the flare of fires. The lunar year cycle is the Sabbath year of release. The Jubilee completes the seventh of a series of seven years. All of the available calendric treatises agree in emphasizing these occasions. The symbol seven is thus all powerful within the framework of the annual calendar. But it loses its mystic powers when computation of intercalation and other calendric problems are involved. One volume citing an earlier work (*Pirke Rabbi Eleazer*) refers to a lunar cycle of 48 years. But our Venetian volume heeds the more exact reckoning of the 19-year cycle for the determination of the sequence of common years and emergence of leap years.

Another major correspondence within available calendar commentaries is the treatment accorded the new moon and the sacred festivals. The more scientific among the commentators have it that the moon evidences its new phases in 793 parts of an hour, that this serves as a measure of time which initiates the lunar month. Many of the volumes explain in similar language how, first, the new moon was determined by direct observation and how this procedure, due to much controversy, gave way to a secret system with an intercalation of a day in the month and a month in a year. Due to persecution, loss of power on the part of the Sanhedrin, etc., no

messengers could be sent forth and announcements of the new moon and calculation had to replace observation. In the Venetian volume and its sources, some of the earliest names for the months are quoted from the Bible: Abib, the first month; Zib, the second; Etanim, the seventh; Bull, the eighth. These names do not appear in the post-Exilic books, except in a quotational sense. Post-exilic writings take for granted the Babylonian names of the months as we know them today.

Of vital significance in all of the available calendar commentaries is the statement accorded the various New Years of the Hebrew Calendar. Most important of the four New Years is the first of Tishri, the original agricultural New Year which marks the beginning of the harvest, and the religious festival of Rash Hashanoh, commemorating the Creation according to priestly reckoning. This festival ranks first with the commentators on the Calendar. Next we have the first of Nisan, the first New Year in the year's chronology, which is utilized for regnal reckoning. Then there is the first day of Elul, the New Year for computation of tithes, although some students ascribe certain specific tithes to the New Year of Tishri. Fourth in importance and reference is the New Year for Trees, the fifteenth day of Shvat, which today is a revival, especially in Palestine, of an ancient festival—the Jewish Arbor Day. A Hebrew legend has it that in ancient Jerusalem a cedar was planted for every new born boy and a cypress for every new born girl, and that from these trees were formed the poles of the wedding canopy for the persons whose birth they honored.

Not only New Years but likewise cycles of leap years supply material for the minds of some of the ablest commentators. An empirical estimate of the leap year was struck by many whereby an extra month is intercalated every two or three years with due consideration to the relative length of the solar and lunar years determined by the Council of Nicaea in 365. The Council provided that Easter, based upon Jewish calendation, be computed on a lunar basis, but that it need not coincide with Passover. Due to persecutions by Constantine the celebration of festivals in the Jewish calendar often occurred on different dates at different places. In order to remedy this discrepancy, Hillel II, a contemporary of the Council of Nicaea but independent of it, made public, in 359, the heretofore secret rules of calendar calculation. Rab Huna ben Abin, in Babylonia, likewise published the "secrets" of the calendar. This dual procedure, which fixed the celebration of Jewish festivals upon a common day for all places, with due consideration for a cycle of leap years within a framework of 19 years and which made duration of winter unto the sixteenth of Nisan a basis for leap year, was followed rather closely by later commentaries. As the process of observation gave way to computation, the third, sixth, eighth, eleventh, fourteenth, seventeenth and nineteenth years were made leap years, while the others were to continue as regular years.

Over cycles of 49 and 50 years there has been a difference of opinion among calendric commentators. Some maintain that jubilee year is included from the seventh cycle, marking the fiftieth year, whereas others hold that this jubilee year itself is but an intercalated year and follows the seventh Sabbatical year, thus providing two successive open years before the new cycle begins. Such references, wherever they occur in later writings, are but echoes of an earlier Talmudic controversy.

Physical and economic as well as religious reasons are given in the commentaries for the enforcement of the Jubilee and Sabbatical years. The Sabbatical year thus serves as a statute of limitations for poor debtors and as a means whereby unfortunates may secure equal footing without fear of increasing insecurity, while the Jubilee year was a year of full freedom for debtor-slaves, etc. However, calendric commentaries reiterate earlier Rabbinical views that such calendar laws do not merely safeguard values of life and land.

Another cross-section in the commentaries, especially in the Venetian volume, is that of signs, omens and observances. The Venetian volume has for its very first line, "*Signs and times for the days of the years,*" and contains a number of designs of purely astrological import. Omens are repeatedly treated as significant in the commentaries.

In the commentaries as in the Bible, omens and observances are interrelated. In fact, the commentaries rarely go beyond expansion and clarification of the earlier Scriptures. Dr. Morgenstern in his *Supplementary Studies in the Calendars of Ancient Israel*, explains in detail how a most sacred event, New Year's Day, originally was simultaneous with observance of a most important *omen* in the year—the fall equinox—the tenth of Tishri, and how this omen and observance included a special welcome to the first rays of the rising sun at the eastern gate of the Temple of Jerusalem and how the dawn symbolized not only the new day, but also the New Year. Later observance of New Year laid stress on the theological omen and this emphasis on the theological is apparent in the Venetian volume. Theological significance in a festival thus outlasted in many instances the calendrical significance.

The commentaries mention certain "signs" of the new moon—for instance, the signal fire, whereby the new moon could be announced to exiles in Greece, Egypt and Asia Minor, who could thus celebrate two days and so include the full day as observed in Palestine. The observance of the dwelling in booths during the celebration of Succoth and the association of four Palestinian "fruits" with this festival are held to be of religious importance in all the literature which treats of them. According to Morgenstern, they once served as nature omens in rites affecting rain and fertility. A similar ceremony of palm branches might be that of Hosana—the Palm Sunday of the Christian Church—an event which probably originated in

the carrying of the Hosana on the first day of the ancient Mazzot Festival. Many modern scholars hold that the four plants of Succoth bear some relationship to the ancient beliefs in Adonis gardens. This view is not entertained, however, by the calendric commentators.

In the ancient Hebrew Scriptures, we are impressed by the consciousness of sound—the voice of the Lord, the thunder on Sinai. This sound-consciousness applies to festivals in the calendar. We read of “the blowing of trumpets” and the “great blasts” on the tenth day of the seventh month as a call to conscience. The Sabbath is solemnized with a “benediction”—a new moon and a feast with a “blessing”—the New Year and a Holy Day with the “blowing of the Shofar,” a ram’s horn with a low sound. The oral law was the moral law.

The Venetian volume has drawings in the shape of horns and bows which relate to festivals, on which whole subject Finesinger’s treatise on *Musical Instruments in the Old Testament* may be usefully consulted. He explains how ancient coins bear silent witness to the musical instruments of the Hebrews, how a pair of trumpets on the arch of Titus “proclaim”—in silence—the capture of Judaea, how the Talmud discusses the uses as well as the sounds of these instruments, how early Church fathers are sources of information of Hebrew musical instruments of the Bible, how Josephus explains some of them. This consciousness of sound by Israel was retained in later calendric commentaries by allusions to feasts, fasts, and festivals with their musical effects.

In the commentaries on the Hebrew Calendar, there is Messianism. This signifies the Super-Festival—“the End of Time”—“the Day of Judgment”—“the one far off divine event,” as Tennyson puts it, “to which the whole creation moves.” Sociologically a longing for this “golden age” is most apparent when a persecuted people endures an “iron age” of persecution. In the year 70, the population of Jewry was 3,500,000. Today it is 16,000,000. But in the year 1500, it was only 1,500,000. Thus Jewish calendric works of the fifteenth and sixteenth centuries reveal an escapist mysticism and an immediate Messianism which to some extent compensated Jewry for Cossack massacres in the East and the Inquisition in the West.

Brotherhood is associated with Messianism. In an early commentary we read: “If all of Israel were to refrain from evil thought, and were to devote its collective will toward Godliness, the Messianic Day would be upon the world.” Another Messianist-minded work quotes an earlier as follows: “As I walked into the mountains one day, in the distance, I saw what seemed to be a wild beast. As I came closer, behold, it was a human being, and as I came closer still, lo and behold, it was none other than my own brother!”

Indeed a goal worthy of enshrinement in the scope and spirit of modern man and his modern “timepiece”—The World Calendar!

TIME UNITS OF HISTORY

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PUBLIC interest in the history of the calendar has been stimulated recently by the progress made internationally in the League of Nations' crusade for a revision of the Gregorian calendar. Evidence of this awakened public interest is seen on all sides—in the press, on the public platform, and especially in the field of book publishing. Discussion of the past, present and future of the calendar has been included in several of the new scientific books, and reviewers have received enthusiastically two books dealing exclusively with calendar problems.

There is still room, however, for a discussion in popular vein, of the scientific backgrounds of man's system of measuring time. It is a story full of curious detail, dealing with the growth and development of one of the simplest practical necessities of our every-day life.

Glancing back across the centuries, we find that on the fertile banks of the Nile, the Ganges, and the Euphrates—many thousand, perhaps a million, years ago—primitive agricultural peoples were just emerging into civilization and facing the struggle for existence. With no schools, no books, and no way to get information that would assist them in raising their crops and looking after their herds, they naturally turned their attention to the heavenly bodies. Their only school was the great outdoors, and the starry dome of the sky was their textbook. How could they be expected to know when to plough, when to sow, and when to reap except by carefully watching the movements of the stars?

Early man naturally became astronomically minded. He carefully and constantly studied the sky, not because he enjoyed it or because he was particularly interested in getting better acquainted with his universe, but rather for purely selfish reasons. Although he thus laid the foundation for the science that now goes by the name of astronomy, it can hardly be said that he was impressed by its cultural value. He was engaged in a desperate struggle for existence and he believed that the stars could be of much practical assistance to him, if only he could understand their movements and read their message.

Modern man spends his evenings under an electric light inside of a twentieth century home or in his automobile on artificially lighted streets and highways, with few opportunities to catch a glimpse of the heavens. Is it any wonder that he finds it difficult to understand how these agricultural peoples became so well acquainted with the stars? It is only on rare occasions that we ever see the sky and many of us are not even aware

of the fact that the stars change their positions, but the setting sun found our primitive ancestors out in the open spaces with nothing over their heads except the star-spangled dome of the sky.

As a result of close association with the heavenly bodies, primitive man soon learned to worship the sun as the creator and preserver of mankind, and to believe that every heavenly body was placed in the sky for his benefit. He needed a calendar in order that he might know in advance when to plough and when to plant. And where could he expect to get this information except from the stars that constantly watched over him and to which even his hidden thoughts were known?

In the search for a convenient unit of time upon which his calendar might be based, early man naturally made use of those varying phenomena of nature which were so vividly impressed upon him. He actually lived by the sun, the moon and the stars. What better units of time could he hope to find than the day, the month and the year, which were given to him by nature herself? We find, therefore, in all early calendars the same three units of time—the day, the month and the year.

We live by the clock, though very few of us have any idea where the clock gets its time, but long before mechanical timepieces were invented, nature was furnishing its time-units in constantly recurring cycles for the regulation of the lives of the inhabitants of the earth.

Our clocks measure time in hours, minutes and seconds, but these short time-units have been invented by man and are not fixed by nature. Our calendar would be just as accurate if we had 100 hours in every day, but we did not start that way. We could easily construct our watches and clocks so that there would be 100 minutes in every hour and 100 seconds in every minute, and these new man-made units of time might prove entirely satisfactory after we became accustomed to them.

The shortest time-unit that nature has given us is the day, which may be defined as the length of time required for the earth to make one complete rotation on its axis. This scientific definition would have meant nothing to early man, who believed that the earth was absolutely fixed in space. Even if he had known about the earth's rotation, such knowledge would have been of no value to him. He was interested in the movements of the sun, moon and stars only insofar as they would assist him in his struggle for existence, and little did he care why they moved.

From the very beginning the daily appearance and disappearance of the sun has been obvious to all plant and animal life. No argument was necessary to convince a primitive people that the sun actually emerged from below the eastern horizon every morning and gradually climbed up into the sky in order that man might have light and heat. Surely this magnificent heavenly body would not so behave were it not for the fact that man was trying to live upon the earth, and his existence would not be possible with-

out these life-giving rays of heat and light which the sun alone could give.

Every modern school boy knows that, as far as the earth is concerned, the sun is not in motion and that it neither rises nor sets. Its apparent daily motion across the sky from the eastern to the western horizon is due to the rotation of the earth from west to east, which exposes to the rays of the sun all parts of the earth in turn without raising the question as to whether these regions are inhabited by human beings. If some great calamity should remove every living thing from the surface of the earth, the brilliant rays of the sun would continue to drive away the shades of night until nature in some way stopped the rotation of the earth.

The rising and the setting of the stars also attracted the attention of early man. He noticed that some of the stars, like the sun and the moon, would climb up above the eastern horizon and then disappear in the west at regular intervals, while others moved very slowly around a fixed point in the sky. He was, of course, not much interested in any scientific explanation of this movement and he had no idea that the center of motion in the sky was merely the point where the axis of the earth pierces the heavens. To him it was sufficient to know that the stars were actually moving, so that when the sun was below the horizon he could read his time from those tiny points of light in the star-lit dome of the sky.

Of course the early philosophers probably wondered why the heavenly bodies were in motion and why the sun, moon and stars were so attentive and performed their duties for the benefit of mankind with such regularity. They dreamed about Apollo, the god of the sun, and his twin sister, Diana, whose duty it was to take care of the moon. Surely the sun and the moon, and even the stars, must have been endowed with eternal life, for how else could they so diligently watch over endless generations of human beings?

The early poets sang the praises of Apollo who daily drove the sun car across the sky after the pearly gates of dawn had been thrown open by the rose-tipped fingers of the goddess Aurora. They also recounted the heroic deeds of the great hunter Orion and they explained the daily westward motion of some of the stars by having Orion chase the seven nymphs of Diana—the Pleiades—across the sky. Even today those of us who can identify the constellations enjoy watching the Pleiades make these nightly flights during the winter season, with Orion in close pursuit.

For certain time-measurements the length of time between two successive risings of the sun or of a given star—a day—was a very satisfactory and convenient unit, but for other purposes it was too short. However, nature was ready with a longer unit and primitive man need only turn from the sun to the moon to find what he wanted. The phases of the moon were visible from all parts of the habitable globe, and the time between two successive new moons—a lunation—was a very convenient unit for measuring longer intervals of time. This time-unit, which was furnished

by the moon and called a "moon-th," was important in all early calendars.

The lunar month is a natural unit of time, equivalent to about 29½ days. It begins at new moon and ends at the next new moon and has nothing whatever to do with the man-made month that we have in our calendar today. The calendar month is merely one of the twelve parts into which our year is divided and has no relation to any of the heavenly bodies. The length of a calendar month now varies from 28 to 31 days.

The lunar month is exactly one lunation and is divided into two equal parts by the full moon, while our month is independent of the phases of the moon. In fact, we may have a month with two full moons in it, or none.

Although the question as to why the moon went through its phases with such perfect regularity was one of the first astronomical problems to be solved by the human race, primitive man was not much interested in the scientific explanation of the behavior of the moon. Nature had invented these recurring phases in order that man might have a convenient time-unit, and he was content to use them to the best advantage.

The explanation of the phases of the moon is very simple. We must remember that the moon does not shine on its own account but merely borrows its light from the sun. It is illuminated only where the sun shines on it. In other words, that side of the moon which happens to be turned toward the sun reflects the light from the sun while the other side is in complete darkness. Sometimes we see all of the bright side and we say that the moon is "full," but usually only a part of it is visible and we see either the gibbous or the crescent moon. If the moon could shine by its own light, as the sun does, it would be "full" all the time.

But the fact that the moon shines by reflected light is not sufficient to account for its varying phases. If the moon should stop revolving about the earth when in the crescent (or any other) phase, this phase would be visible to the human race forever and, although the moon would continue to rise and set, the lunar month would have disappeared.

For measuring long periods of time we must have a unit that is longer than either the day or the lunar month, if we are to express our results in a convenient form. Here again nature came to the assistance of the early calendar makers by furnishing them a third natural unit of time—a year—with its four seasons, spring, summer, autumn and winter. Most of us are not aware of any difference in the appearance of the heavens at different seasons of the year. When we tear off the last page of our calendar and hang up a new one we realize that a new year has begun, and we wonder how it was possible to identify New Year's Day before printed calendars were available.

Anyone who takes the trouble to study the sky will notice a shifting of the stars relative to the sun at different seasons. A brilliant star-group known as Orion occupies a very prominent place in the eastern sky after sunset in January, but if we wish to locate this well-known constellation at sunset several months later we must look in the western sky. This westward shift of the constellations with reference to the sun, which is entirely independent of their rising and setting, furnished a method of determining the length of the year long before man ever had much use for a calendar.

We define a year as the length of time required for the earth to make one complete revolution around the sun and we understand that this shifting of the stars with the seasons is a direct result of our motion, but primitive man lived on a fixed earth and to him such motion was out of the question. He noticed that the heavens had an entirely different appearance at different seasons of the year and he naturally assumed that the seasons themselves were brought about by the appearance of certain groups of stars in certain places in the sky.

When the sun got into that part of the sky known as the Celestial Sea, occupied

by such constellations as the Water Carrier, the Fishes, the Whale and Noah's Ark, man was sure to have his rainy season. In fact he could always tell by watching the changing positions of the constellations when to plough and when to reap, and consequently the stars acquired a fictitious importance which we, even in this century, have not yet quite forgotten.

Study of the westward drift of the constellations with reference to the sun resulted in the invention of the Zodiac by the Babylonians about 28,000 years ago. The Zodiac, which is probably the oldest scientific heirloom of the human race, is the name given to a zone in the sky extending a few degrees on each side of the apparent path of the sun. The stars in this zone were grouped into constellations and each star-group was given a name which had some relation to the season of the year when the sun passed over it. Here also were those four bright stars—Aldebaran, Antares, Regulus and Fomalhaut—which, according to Persian and Chinese records, marked the position of the sun at the beginning of the four seasons of the year about 5000 years ago.

The constellations of the Zodiac were well known to all early peoples and the progress of the sun around this zone was very carefully noted throughout the year. Of course they could not actually see the constellation in which the sun was located at any particular time, but by studying the eastern horizon immediately before sunrise and the western horizon immediately after sunset, they could get a very accurate estimate as to the exact position of the sun in the Zodiac.

With the exception of the Scales—the constellation in which the sun was to be found in September when the days and nights were equal—all of the zodiacal constellations, as they have come down to us from classical literature, were named after living creatures. Who can blame the classical poets for not being able to resist the temptation to sing about the perilous journey of the sun around the sky, which included an annual encounter with the Ram, the Bull, the Twins, the Crab, the Lion, the Virgin, the Scales, the Scorpion, the Archer, Sea-Goat, Water Carrier and Fishes?

The Zodiac seems to have been used by all early peoples although the stars in this zone were not always grouped into the same number of constellations. In almost every case the Zodiac was pictured as a circular belt of living creatures, but it would be too much to expect tribes living in widely separated regions of the earth to use the same set of animals. In the early Japanese Zodiac we find the Rat, the Tiger, the Dragon, the Horse, the Monkey, the Dog, the Bull, the Rabbit, the Snake, the Sheep, the Cock and the Wild Boar, but this curious menagerie would not be satisfactory to any other nation.

As the inventors of the Zodiac watched the sun make its annual trip through this zone of constellations, they recognized another unit of time—a year—which they could use to advantage. By common agreement the year began when the sun reached a certain constellation and ended when it

returned to this same place in the sky. As far as man could determine, this time-unit which nature had so generously provided was entirely satisfactory and Spring would always begin when the sun reached the constellation now known as the Ram. Unfortunately the situation was not so simple.

After the sun had made a thousand or more trips around the Zodiac man discovered that Spring began before the sun got back to the Ram. In other words, the Vernal Equinox was slowly slipping westward around the sky. This led to the arbitrary division of the Zodiac into twelve equal areas, now known as "signs," which have nothing to do with the constellations. The sun spent one month in each sign, and the signs were supposed to slip gradually westward at such a rate that the sun would always enter the sign of the Ram at the beginning of Spring.

Modern astronomers make use of both the signs and the constellations of the Zodiac, but they were invented so long ago that the Vernal Equinox has backed completely around the Zodiac and has made some headway on its second circuit, for the sign of the Ram now—for the second time—corresponds to the constellation of the Fishes. Two thousand years hence the Spring sign—the Ram—will coincide with the Water Carrier.

The constellations of the Zodiac may be easily identified in the sky and are constantly studied by the astronomers. The signs of the Zodiac have little, if any, scientific value and are usually pictured, not in the sky, but on the covers of our patent medicine almanacs.

Another natural division of time, which made a great impression upon our primitive agricultural and nomadic ancestors and still affects the lives of all of us to a very great extent, is the "season." From the beginning of history the year has been divided in seasons but, since each has a different length, they are of no great value as time-units.

It is obvious that, as the sun moves around the Zodiac, it is in the northern part of the sky during half of the year and in the southern part during the other half. On the twenty-first of March it crosses the equator, moving from south to north, and Spring begins in the northern hemisphere. Our days begin to lengthen and after 93 days (June 22) the sun reaches the northern limit of its starry track and Summer begins as it starts back toward the south. The length of the day from sunrise to sunset in New York City is then 15 hours and 9 minutes.

About September 23 the sun again crosses the equator and we realize that Summer is over and Autumn has taken its place. The sun then continues its journey toward the south for 90 days until December 22, when it again reverses its direction and starts toward the north. By this time the length of the day from sunrise to sunset in New York City has been reduced to 9 hours and 14 minutes. We are then forced to defend ourselves against the rigors of Winter for 89 days until the sun gets back to the equator and nature announces the beginning of Spring.

It is only in the Temperate Zones that our *four* seasons are noticeable. In the Torrid Zone there is usually only a wet season and a dry season, and inhabitants of Polar regions have only two seasons—Winter and Summer.

We sometimes find it convenient to break up one or more of the four seasons into shorter periods. Thus in temperate latitudes there is a short season of fair, warm weather, called Indian Summer in America, and Saint Martin's Summer in Europe. The Japanese once divided their year into 24 seasons with names like Less Cold and More Cold, the origin of which is obvious. A similar sub-division of the four seasons was made by some of the Indian tribes of North America.

Every race, every nation, every tribe has its philosophers who dream about the "why" and the "wherefore" of interesting phenomena and attempt to explain the origin of everything that comes within their sphere of observation. The recurring seasons presented a puzzle upon which primitive philosophers spent countless hours in deep meditation and poets sang verse after verse in almost endless succession. What made the grass and all other vegetation shoot out of the ground as soon as the sun entered the sign of the Ram, only to go back again when the sun-god had conquered the Lion and reached the Scales? The attempt to answer this question gave rise to the first kidnapping story in history and the greatest of all time, at least as far as the principals were concerned.

Surely vegetation would not behave in this way had not Pluto, the god of the lower regions, kidnapped Proserpina, the daughter of the goddess of vegetation, and carried her to his abode deep down inside the earth. In order that man might not starve for want of food the all-powerful Jupiter, the king of the gods, forced Pluto to allow Proserpina to spend half of every year in her earthly abode. When she came out of Hades the flowers began to bloom, the birds began to sing and the crops began to grow, only to disappear six months later when Proserpina's vacation was ended and she departed for the realm of Pluto.

Although modern people are unwilling to accept the story of the kidnapping of Proserpina by Pluto as an explanation for the recurring seasons, few of us have anything to offer in its place. We have traveled far and wide and have met people from the southern hemisphere who tell us that they also have seasons but their seasons are exactly opposite to ours. We have learned that when the sun crosses the equator near the end of March and our days begin to grow longer and warmer, our neighbors to the south are just obtaining relief from the intense heat of January and February and are preparing for the shorter and colder days that are to follow. But most of us feel that nature has arranged things that way and we can do nothing about it so why try to explain it?

With our knowledge of astronomy the explanation of the recurring seasons is easy. Our seasons are due to the simple fact that as the earth revolves around the sun it leans $23\frac{1}{2}$ degrees from the "vertical" and keeps its axis of rotation always pointed in a constant direction. In other words, the earth moves in such a way that the axis always remains parallel to itself. If this were not true there would be no seasons. When nature thus set the earth in motion with its axis leaning $23\frac{1}{2}$ degrees from the "vertical" she automatically drew the lines which divide the earth into five zones. We could transfer St. Louis from the North Temperate to the Torrid Zone if we only knew how to change this angle.

Since we get all of our heat from the sun, one sometimes wonders why we do not have summer all over the earth in January when we are closest to the sun, and winter in July when we are farthest away. It is true that the earth is 3,000,000 miles nearer the sun in January than in July, but the surface temperature of the earth depends upon the angle at which the sun's rays fall upon it rather than upon this very slight variation in our distance from the celestial furnace.

The people in the southern hemisphere do have their summer at the time when the earth is closest to the sun, but nature has so arranged things that their summer is seven days shorter than ours, for a study of our calendar will disclose the fact that the sun is north of the equator 186 days in every year and south of the equator only 179 days. However, when we come to compare the winter seasons in the two hemispheres we find that not only do the people in the southern hemisphere have their coldest weather when the earth is farthest from the sun, but their winter is seven days longer than ours.

CURRENT PRESS COMMENT

English Advocates

London (England) Morning Post

Advocates of a reform of the calendar include the Astronomer Royal, Lord Desborough, Mr. H. G. Wells, and the Dean of St. Paul's. The proposed reform, now known as the Desborough Plan, embodies a perpetual year of 12 months with four equal quarters.

This scheme also provides for the fixing of Easter. It is contended that one advantage will be the possibility of making accurate comparisons in monthly or quarterly statistics.

Universal Adoption

Danville (Ill.) Commercial News

Movement for universal adoption of a world calendar is gaining momentum and there are indications that the League of Nations, which took the leadership of this project in 1923, will call an international conference to determine how the change will be made. Favorable action will see the new calendar go into effect on Jan. 1, 1939.

There has been a noticeable swing to the equal quarter calendar. Sentiment for a 13-month plan apparently is rapidly losing ground. There will be no interruption of existing business practices if The World Calendar is adopted, rather many business and legal matters will be simplified. The Gregorian Calendar has served us well, but a more efficient system is surely on the way.

Catholic Interest

London (England) Catholic Times

Easter provides a considerable problem whenever calendar reform is discussed and it is not unnatural, therefore, that the Rational Calendar Association, which hopes to gain Catholic support, should give the matter special attention.

In a letter accompanying its annual report the association describes as the main obstacle to a fixed Easter the withholding of the Catholic Church's assent, but goes on to state that "the view is now held that

there is a better prospect of securing this assent if Easter reform is not isolated from general calendar simplification."

Last year the association organized a mission of inquiry for the purpose of discovering the Vatican's attitude. Headed by Abbot Cabrol, of Farnborough, who is an authority on liturgical matters, the mission presented to the Pope a memorial in Latin on behalf of the association and kindred associations in America, France, Germany, Canada and South America.

British Empire Action

London (England) Saturday Review

The Federation of Chambers of Commerce of the British Empire has forwarded to the British and Dominion Governments a resolution urging the adoption of a perpetual calendar of four equal quarters, with a fixed Easter.

The resolution was adopted at a plenary meeting of the 14th Congress of the Federation in Wellington, New Zealand, attended by delegates from Chambers of Commerce in all parts of the Empire. It was proposed by Mr. R. L. Barclay, of the London Chamber of Commerce.

Business Needs

Syracuse Post-Standard

There is nothing sacrosanct about the calendar. It is merely an instrument to measure time and has been changed in earlier times. Yet proposals to alter it now, while not actually meeting with great resistance, do not get overwhelming response. It is like trying to move a mountain, the mountain of public indifference.

Several types of calendars have been proposed. One of the best known is the one which would retain the present number of months, but would arrange them so that each quarter year and each half always has an identical number of days. A change of this kind would aid business in making and using financial records and would enable comparisons of quarters to be made with great accuracy. Holidays would come on the same days of the year, in most cases. Compensation would be provided by year-end and leap-year days.

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ELISABETH ACHELIS, *President*

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ENERGETIC leadership for calendar reform by the Chilean delegates at the International Labor Office conference at Geneva, last June, made it possible for the League Council, in January, to take action on the question so as to bring it to a definite international agreement. The Council unanimously voted that the draft convention, presented by His Excellency Augustin Edwards, Chilean member of the League Council, be submitted to all the governments for their immediate attention.

The significance of this draft convention lies in the fact that for the first time the League of Nations has given recognition to a definite plan for reform. The treaty provides: "The High Contracting parties resolve to bring into effect in their respective territories, beginning with January 1, 1939, the perpetual calendar of 12 months and equal quarters, known as The World Calendar." In addition, the treaty was referred by the Council to the Transit and Communications Section of the League with the request that it give prompt and serious consideration to steps for the calling of an international diplomatic conference.

Thus is recognized the importance that this Section of the League, under the leadership of the late M. Robert Haas, played in the international movement for calendar reform. As successor to M. Haas, the newly-appointed director of the Section, M. Pierre H. Watier, finds that calendar reform is the most pressing and immediate task before the reorganized Section on Communications and Transit. In accordance with the instructions of the League Council, it will be necessary for the Committee to examine the draft treaty, sent to the governments by the League Council, and to define the procedure whereby the calendar can be put into operation.

Everyone interested in calendar reform should aid the League of Nations toward international adoption;—governments by approving without delay League action and expressing their willingness to attend an international conference; organizations and individuals by impressing upon their governments the importance of reform; and calendar organizations by stressing to their governments the benefits the reform will bring. The establishment of a single time-measurement is a force drawing nations, religions and peoples closer together for world cooperation and unity.

EXCERPTS AND REVIEWS

Why Not Thirteen?

By DR. RUDOLPH BLOCHMANN

Famous German Calendar Reform Leader

WHILE thinking people throughout the world are keenly interested in obtaining a perpetual calendar—one in which every year shall be the same, there are two conflicting methods of obtaining this result. The proposals for a 13-month arrangement of the year require careful examination because at first sight they seem to offer certain advantages.

But study of the 13-month plan soon reveals that it completely destroys the structure of our present calendar. It breaks down all continuities, all connections with the past.

For thousands of years, mankind has been accustomed to a 12-month year. All monthly statistical computations are based on this arrangement. Even the religious calendar has such a year as its foundation, and this explains the universal opposition of the churches to a 13-month arrangement.

Business and commerce oppose the 13-month plan because it serves to increase expenses of management. Monthly reports and statements would have to be made 13 times a year instead of 12 and the extra cost in labor and expense is therefore at least 8 per cent. Quarterly statements, widely used in business, become very difficult in a 13-month year, and it is estimated that the collation of such quarterly reports would entail an additional expenditure of 25 per cent.

Even the placing of the intercalary day in Leap Year becomes a difficult matter in a 13-month calendar: certainly it cannot be placed so as to divide the year into equal halves.

The difficulties of the use of 13 as a factor or fraction are enormous. Thirteen is not factorable, is not divisible by any other number, is awkward alike in division and multiplication. Most people can multiply by 12 by a visual process; very few can multiply by 13 without the use of pencil and paper.

The conclusion is inevitable that a 13-month division of the year increases the

handicaps of the present calendar, instead of ameliorating them. It makes the calendar more complex, not more simple.

We are thus led to decide, as most people have decided, that the 12-month equal-quarter calendar is the revision which the world needs.

Scientists Urge Change

By DAVID DIETZ

Scripps-Howard Science Editor

CALENDAR reform is once more a topic of discussion among the scientists of the world and many of them are hoping that something can be done about the calendar in the near future.

The present, far-from-perfect calendar has grown up through the ages by a process of trial and error. There are three natural units for the measurement of time, each arising from a different natural phenomenon.

First of all, there is the day, fixed by the rotation of the earth upon its axis. Next there is the month, originally determined by the revolution of the moon around the earth. Finally there is the year, fixed by the revolution of the earth around the sun.

Now if the lunar month was in length equal to an exact number of whole days, and if further, a certain number of lunar months fitted exactly into the year, there never would have been any difficulty about the making of calendars. But such is far from the case.

The Roman Calendar finally became so hopelessly confused that it was best described by a famous remark of Voltaire: "The Roman generals always triumphed, but they never knew on what day they triumphed."

League Efforts

By FRANK PARKER STOCKBRIDGE

Editor of *Today and Tomorrow*

THIS is the year in which the League of Nations is expected to take up in a serious way the matter of calendar reform. Most of the opposition to calendar

reform has vanished, and the main question now seems to be whether it will be a 13-month year, as was advocated by the late George Eastman, or a 12-month year with the months rearranged by subtracting days from some of them and adding them to others. At present the 12-month plan seems to be in the lead.

Changing the calendar is a good deal like changing from standard time to daylight saving time; a lot of people seem to think that it is man tinkering with an act of God. But our present calendar has been revised twice since it was first promulgated by Julius Caesar, and the last revision was directed by Pope Gregory VI. The present Pope has expressed a friendly attitude toward further revision, and so have the leaders of other religious groups. I think something is going to come of this.

Our Absurd Calendar

By J. B. PERRY ROBINSON

Secretary, Rational Calendar Association,
London

STUDY of the calendar for 1937 discloses rather more than the customary number of calendrical absurdities. As compared with 1936, there will be three fewer working weekdays in the first quarter and two more in the second quarter. The biggest popular holiday of the year, Easter, has shifted into a different month and into a different quarter. In fact, the financial year that ends on March 31, 1937, will have contained two Easter holidays, whereas its successor will contain none.

The effect of such discrepancies is that all monthly or quarterly statistics of comparison between 1936 and 1937 will be misleading. Every periodic stocktaking in which the months or quarters of one year are compared with those of the other year will necessarily be fallacious, from the Board of Trade monthly statistics to the comparative calculations made by retail traders, hotel proprietors and newspapers.

It has become increasingly evident that a rough-and-ready calendar, which served its purpose in the days of Julius Caesar, is ill-adapted to the needs of our highly organized society. Recognition of the fact that the Gregorian Calendar is out of date

is responsible for the draft convention sent to all governments by the January meeting of the League of Nations Council. The system of reform contained in this draft treaty has the support of all the British Chambers of Commerce as well as of representative religious and astronomical opinion.

Human Side of the News

By EDWIN C. HILL

Popular Radio Commentator

NAZI GERMANY takes calendar reform very seriously. Herr Hitler strongly favors the 12-month as against the 13-month plan. An odd toss of chance here may turn history to a new time accounting.

In 1919 Hitler was the seventh man to join the German Workers' party, which finally lifted him to power. This experience gave him high esteem for the number 7, and regard for the potency of numbers in general, with an equal dislike for the number 13.

So in Germany it has been thumbs down on the 13-month year, but the Germans, in their usual workmanlike manner, propose to make a thorough job of these calendar changes and to change the names of the months as well, in accordance with the pagan, Nordic backdrop of Germany today.

By law and custom we work and play by a calendar year which is an awkward arrangement, troublesome to business.

The Episcopal General Convention has adopted resolutions favoring a general calendar shake-up, and particularly the stabilization of Easter, which religious organizations throughout the world have been trying to get back on the temporal gold standard for a long time.

The Universal Christian Council has taken the same action.

The Federal Council of Churches of Christ in America reported agreement some time ago on calendar reform by the three branches of the Christian Church—Catholic, Protestant and Greek Orthodox.

Calendar changes usually have originated with religious groups; but there is now an increasing lay activity, busy and organized, interested in making, or trying to make, the work year a little more shipshape without any ravelings or loose ends.

FROM THE MAIL BAG

We are all hoping that some day this will really give some result.—Lord Riverdale, Sheffield, England.

Such a calendar would be a very progressive step that would be an improvement in the administration of educational programs. It would certainly simplify matters in regard to many of the duties which the State Education Department has in regard to education. Such things as schedules for visits to various sections of the State, arrangement of meetings, holidays, vacations, expense accounts and the planning of programs would be greatly facilitated.—C. M. Miles, Supervisor Physical Education, State of New York.

Personally I would be glad to see a change in the date of Easter for it seems an absurdity in the Christian Church to have the date of the birth of Christ calculated by a solar calendar and that of His death and resurrection by a lunar calendar.—S. A. Mitchell, Dir., Leander McCormick Observatory, Univ. of Va.

For my purposes, a new calendar should be readily adjustable for seasonal variation.—S. B. Meredith, Chief Statistician, Francis I. du Pont & Co., N. Y. C.

The subject is one of wide interest, and this Ministry will be pleased to receive any publications that you may issue from time to time.—T. C. Woo, Secy.-Gen., Ministry of Education, Nanking, China.

A rational calendar is badly needed, and the proposed World Calendar offers the best solution in harnessing together the incommensurable year and the seven-day week.—Commander E. Ellsberg, U. S. N. R., Westfield, N. J.

Am heartily in favor of the new 12-month plan calendar and hope it will be adopted soon.—K. K. Tibbets, Supt. of Schools, Wheaton, Ill.

The Church should lead, with agreement, if possible, by the Roman, Anglican and Eastern Communions. A committee, appointed by the Pope of Rome, the Archbishop of Canterbury and the Eastern Patriarch should take the initiative.—Rt. Rev. T. F. Gailor, Bishop of Tennessee.

I am indeed happy to learn of the progress being made toward adoption of The World Calendar.—F. B. Upham, Rear Admiral, U. S. N., Washington, D. C.

It is to be hoped that in 1937 the movement for calendar reform will make further progress in Germany as well as in other countries concerned with this matter.—W. Lange, Berlin.

The new twelve month calendar has my full sympathy.—J. H. Graves, Supt. Schools, Monterey, Calif.

I am sure the stand of the Archbishop of Canterbury will be very gratifying to all members.—C. H. Armstrong, Assistant Actuary, Imperial Life Assurance Co., Toronto.

Am personally considerably interested in the matter of calendar reform.—Arthur Bevan, Sec. Assn. Amer. State Geologists.

The proposed twelve-month and equal-quarter calendar adopted by The World Calendar Association is from all points of view, and especially that of education, more convenient and, therefore, superior to any other proposed form.—M. Bartlett, Pres., Hobart College, Geneva, N. Y.

One feels that however long and difficult the road, there is victory at the end.—C. E. Kirk, Natl. Pres., Natl. Council of Women of New Zealand, Wellington.

Have been an advocate of the Cotsworth Plan, but would vote for the 12-month World Calendar as an improvement on the present method.—Rev. M. R. Sanyers, Centerville, Iowa.

Voted favorably on calendar revision as member of the council of the American Association for the Advancement of Science.—H. E. Enders, Dean of School of Science, Purdue University.

Heartily in favor of a fixed date for Easter. I also believe that your entire reform calendar would be a good thing.—E. G. Richardson, Bishop, Methodist Episcopal Church, Philadelphia.

Your World Calendar seems to me to be ideal.—Walter Dill Scott, President, Northwestern University.

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INTERNATIONAL ORGANIZATIONS FOR REFORM OF THE CALENDAR

ARGENTINA: Comite Argentino del Calendario Mundial, Dr. C. D. Perrine, Chairman, Cordoba Observatory, Cordoba.

BELGIUM: Belgian National Committee on Calendar Reform, Royal Observatory, Brussels.

BOLIVIA: Comite Boliviano del Calendario Mundial, Don Moises Santivanez, Chairman, Biblioteca Nacional, Sucre.

BRAZIL: Comite Brasilerio del Calendario Mundial, Captain Radler de Aquino, Chairman, Rua Raul Pompeia No. 133, Rio de Janeiro.

CANADA: Rational Calendar Association, Lt. Col. J. Murray Muir, Secy., Room 218, 2 College St., Toronto 5.

CHILE: Comite Chileno del Calendario Mundial, Padre Valentin Panzarasa, Chairman, Rector del Colegio Patrocinio de San Jose, Bellavista 0550, Santiago.

CHINA: Chinese Association for the Study of Calendar Reform, Ch'ing-Sung Yü, Director, National Research Institute of Astronomy, Nanking.

COLOMBIA: Comite Colombiano del Calendario Mundial, Dr. Eduardo Posada, Chairman, Consulado General de Honduras, Apartado 42, Bogota.

COSTA RICA: Comite Costarricense del Calendario Mundial (Igualmente de Guatemala, Honduras, San Salvador y Nicaragua), Don Teodoro Picado, Chairman, Ministro de Educacion Publica, San Jose.

ENGLAND: Rational Calendar Association, C. David Stelling, Director, 38 Parliament Street, London.

FRANCE: Bureau d'Etudes pour la Reforme du Calendrier, Paul Louis Hervier, Secy., 5 Rue Bernoulli, Paris.

GERMANY: Deutscher Ausschuss für Kalenderreform, Dr. R. Reichard, Chairman, Ministry of Interior, Berlin—Der Weltbund für Kalenderreform, Dr. Rudolph Blochmann, Secy., 24 Lornsenstrasse, Kiel.

GREECE: Greek National Committee on Calendar Reform, Prof. S. Plakidis, Secy., Observatory of Athens, Athens.

HUNGARY: Hungarian Committee for Study of Calendar Reform, Dr. Paul Vajda, Secy., 9 Eotos Utca, Budapest.

IRISH FREE STATE: Committee for Calendar Reform, E. K. Eason, Secy., 80 Mid. Abbey St., Dublin.

ITALY: Italian National Committee on Calendar Reform, Prof. Amedeo Giannini, Secy., Via del Seminario, 113, Rome.

MEXICO: Comite Mejicano del Calendario Mundial, Don Joaquin Gallo, Chairman, Observatorio Astronomico Nacional, Tacubaya, D. F.

PANAMA: Comite Panameno del Calendario Mundial, Don Octavio Mendez Pereira, Chairman, Panama.

PERU: Comite Peruano del Calendario Mundial, Don Luis Montero y Tirado, Chairman, Casilla 220, Lima.

SOUTH AMERICA: Comite Latino-American del Calendario Mundial, Dr. I. Gajardo Reyes, President, Santiago, Chile. This committee directs the activities of national organizations in Argentina, Brazil, Costa Rica, Mexico, Uruguay, Chile, Peru, Bolivia, Colombia and Panama. The honorary presidents of the committee are Dr. L. S. Rowe, Director-General of the Pan American Union and Dr. Alfredo de Castro.

SPAIN: Spanish Calendar Reform Committee, Father Luis Rodes, S. J., Chairman, Ebro Observatory, Tortosa.

SWITZERLAND: Swiss National Committee on Calendar Reform, Prof. Emile Marchand, Secy., Mythenstrasse 2, Zurich 2.—Comite International de Coopération de l'Association Universelle du Calendrier, M. Raymond Mage, Secrétaire Général, Palais Wilson, Geneva.

TURKEY: Committee on Calendar Reform, Prof. Ihsan Ali, Secy., Ayas Pasa Nimet Art. 3, Istanbul.

URUGUAY: Comite Uruguayo del Calendario Mundial (Igualmente del Paraguay), Prof. Alberto Reyes Thevenet, Chairman, Liceo de Ensenanza Secundaria Hector Miranda, calle Sierra 2268, Montevideo.

EDITORIAL PARAGRAPHS

The Holy See does not object in principle to a better calendar. After all, was not its own Pope Gregory one of the great reformers?—*New York Times*.

Many organizations in all parts of the world are seeking reform of the calendar.—*Washington (D. C.) Star*.

The question of calendar reform is again on the agenda of the League of Nations for the present year, and its proponents hope that definite international action may be taken so that the change may be made effective with the beginning of 1939, the next year in which January 1 falls on a Sunday.—*Providence (Rhode Island) Journal*.

Facts about leap year have been gathered by the research department of The World Calendar Association, which is the leading American authority on matters connected with the calendar and the various proposals for its revision and reform.—*Janesville (Wisconsin) Gazette*.

Because of interest developing rapidly in the United States among business, scientific, educational and religious groups for a change, it is entirely possible that, before another session of Congress ends, at Washington, the question may come up for action by our own government.—*Newport (Rhode Island) News*.

The calendar which will be advocated at Geneva makes the four quarters of the year of equal length, with each quarter beginning on Sunday and ending on Saturday. In each quarter there are two 30-day months and one 31-day month.—*Albany (Georgia) Daily Herald*.

Astronomy has become an exact enough science to permit the construction of a calendar that would be both simple and accurate. While every consideration should be given to the beliefs of every religion, blind intolerance should not compel the world to struggle through the centuries with an antiquated, awkward jumble of years, months, weeks, days and hours with which to measure their passing.—*Mobile (Alabama) Register*.

The calendar should be changed so that it would be the same every year. Our pres-

ent calendar is clumsy, inconvenient and lopsided. It is badly in need of overhauling.—*Waterloo (Iowa) Courier*.

The world has gotten along very well with the Gregorian calendar, though it took a long time for some countries to adopt it. Turkey did not fall in line until 1927. But dissatisfaction with the uneven quarters has been often expressed, and it is claimed for The World Calendar which the League of Nations will soon consider that it represents the closest approximation to perfection that is conceivable.—*Dothan (Alabama) Eagle*.

Calendar reform will again be examined at Geneva. Recommendations will follow the wishes of the delegates in conference. Agreement will be directly the business of the nations endorsing the reform—and a difficult business, but the urge to simplify man's arbitrary division of time will probably solve the problem in the modern way—that is speedily.—*Johnson City (Tennessee) Chronicle*.

There is nothing sacrosanct about the calendar. It is merely an instrument to measure time and has been changed in earlier times.—*Lynn (Mass.) Item*.

The Washington representative of the calendar reform committee says that international action on calendar reform is urged by the United States government in an announcement of the report of the cabinet committee which has been studying the subject.—*Salina (Kan.) Journal*.

Calendar reforms move slowly. The Russians did not adopt the Gregorian or New Style calendar until 1917, 400 years after Pope Gregory fixed the solar and calendar years. But modern civilization is swifter. The proposed reform may come rapidly.—*Jeanette (Pa.) News Dispatch*.

Change of this kind would aid business in making and using financial records and would enable comparisons of quarters to be made with great accuracy. Holidays would come on the same days of the year, in most cases. Compensation would be provided by year-end day, another holiday, and leap-year day every fourth year.—*Kansas City (Mo.) Journal Post*.



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JULY, 1937

JOURNAL OF CALENDAR REFORM

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All Years Alike
All Quarters Equal

First Quarter

JANUARY						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
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Second Quarter

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Third Quarter

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Fourth Quarter

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DECEMBER						
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17	18	19	20	21	22	23
24	25	26	27	28	29	30

*YEAR-END DAY, December Y, follows December 30th every year

**LEAP-YEAR DAY, June L, follows June 30th in leap years

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a "perpetual" calendar. Every year is the same; every quarter identical.

In this new calendar, each quarter contains exactly three months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Every month has 26 weekdays.

In order to make the calendar perpetual (identical for every year), at the same time retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30th and January 1st and considered an extra Saturday. The 366th day

in leap years, called Leap-Year Day, is intercalated between June 30th and July 1st on another extra Saturday. These intercalary or stabilizing days are tabulated as December Y and June L, and would probably be observed as international holidays. January 1st, New Year's Day, always falls on Sunday.

The revised calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, coordinates the different time-periods, and stabilizes religious and secular holidays. As compared with any other proposal for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made without disturbance.

"Our stability is but balance."—Robert Bridges.

A NEW BOOK
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*Addresses and Occasional Papers Chronologically Arranged
on the progress of Calendar Reform Since 1930.*

By ELISABETH ACHELIS

Interesting and entertaining is the collection of facts about the calendar found in this book. To many people the months and days appear to be as fixed as the law of the gods and Persians. But the author has fascinatingly shown that the calendar has been inuously changing since its origin in prehistoric times and that it calls for improvement now. A half-tone reproduction of The World Calendar in the front matter of the book and a folding chart comparing The Gregorian Calendar with The World Calendar at the end of the text makes the changes easily understood.

The center of the movement for calendar reform is the League of Nations which has been dealing with the matter as a clearing house of research and information for more than a dozen years. The World Calendar Association is the largest organization working for the reform of the calendar, its membership reaching out into many lands. It works closely with an international committee at Geneva which acts as a liaison office between twenty-four committees in various countries and the League of Nations.

Miss Elisabeth Achelis of New York has been President of The World Calendar Association since its organization in 1930. She is also President of the central coordinating committee in Geneva.

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P. H. WATIER

New Director of the League of Nations' Commission on Communications
and Transit. (See Page 68)

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EDITORS

CHARLES D. MORRIS CHARLES C. SUTTER

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ELISABETH ACHELIS, *President*



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LEAGUE MOVES FORWARD

TECHNICAL obstacles to immediate advancement of calendar reform proposals at Geneva have been removed during the past month, by definite action of the Council of the League of Nations.

The action of the League Council, designed to accelerate the final stages of international legislation for enactment of calendar reform, was taken at the 97th session on May 26th.

It directs the League's Commission on Communications and Transit to meet for definite decisions on this subject during the summer and to present its decisions and recommendations to the Council of the League of Nations at the September session.

Thus a legalistic difficulty, namely the delays occasioned by the pending reorganization of the League's Commission on Communications and Transit, which threatened to postpone action on calendar reform until next year, has been overcome.

As explained to the League Council by M. Edwards of Chile, the motion offered to the Council had one object only; namely, "to make sure that the Report [on calendar reform] would be presented to the Council for the September Session. It just happened that the Advisory and Technical Committee for Communications and Transit was under reorganization, and was the body which was supposed to report both on the draft Convention and on the communications which would be received from the Governments in reply to the circular which was sent by the Secretary-General. I was afraid that, as that Advisory and Technical Committee was being

reorganized, it might happen that there would be nobody to present a Report in time. Therefore, I requested that this question should be put on the agenda simply for that purpose."

The suggestion of M. Edwards met with the unanimous approval of the League Council. The approval was voiced in a vote on a report (*Document C 258-1937-VIII*) presented by M. Litvinoff, which in effect directed that the *old* Commission of Communications and Transit, which will continue to exist until the end of the year 1938, will be convened sometime at the end of August or during the first days of September, solely for the purpose of formulating final recommendations regarding enactment of the New Calendar. The text of M. Litvinoff's report is as follows:

Members of the Council have seen Document C.234.1937.VIII, in which the Secretary-General transmitted to them a letter dated May 11th, 1937, from the representative of Chile, asking for the question of the reform of the calendar to be placed on the agenda of the next session of the Council. In compliance with that request, the question has been included in the provisional agenda of the present session.

You will remember that the Council decided on January 25th, 1937 (96th session):

First, to refer the draft Convention on the Reform of the Calendar, handed in to the Council by the representative of Chile, to the Advisory and Technical Committee for Communications and Transit, and at the same time to bring it to the notice of Governments; and

Secondly, to recommend to the attention of the Advisory and Technical Committee for Communications and Transit a resolution dealing with the reform of the calendar adopted by the International Labour Conference on June 24th, 1936.

In accordance with that decision, the Secretary-General communicated the draft Convention to the Governments of the States Members and non-Member States by circular letter dated March 12th, 1937, requesting them to let him have their observations thereon before August 1st, 1937, if possible. He also informed them that the draft Convention had been referred to the Advisory and Technical Committee for Communications and Transit, to whose attention the Council had further recommended the above-mentioned resolution of the International Labour Conference.

In addition, members of the Committee have received the text of the draft Convention and an extract from the minutes of the Council's meeting of January 25th, 1937. A copy of the aforesaid circular letter was attached for information. The Advisory and Technical Committee has not met since the Council's 96th session, and consequently has not yet been able to consider either the draft Convention or the resolution of the International Labour Conference.

I would accordingly suggest that the question of the reform of the calendar be held over till our session in September next, as the Advisory and Technical Committee has in the meantime to study the draft Convention in the light of such observations as Governments may submit, and with reference to the resolution of the International Labour Conference.

The Committee's report must reach the Council soon enough for the latter, at its September session, to be in possession of all necessary information.

Whole-hearted cooperation in accelerating the League's consideration of calendar reform was given to M. Edwards and M. Litvinoff by all the factors concerned in the pending reorganization of the League's Commission on Communications and Transit.

The plans for reorganization are at present in the hands of a "Re-organization Committee," which met in Paris early in May with M. Watier,

the new director of the Commission on Communications and Transit. Discussion of calendar reform was one of the important subjects taken up, and it was pointed out by President Krbec and Vice-President de Castro that the progress made toward calendar reform should not be endangered by delays incident to the plans for reorganization of the Commission. It was, therefore, decided to ask the League Council to instruct the old or "existing" commission to complete its studies of calendar reform and bring its findings before the September meeting of the Council.

To accomplish the convoking of the old Transit Commission, the services of the Chilean Government were enlisted. Through its representative, M. Edwards, calendar reform was placed on the agenda of the May Council meeting, with the friendly assistance of M. Litvinoff, rapporteur of the Commission on Communications and Transit, who, at the January Council meeting, had presented a report on calendar reform. The result of their proposals at the May meeting of the Council was a unanimous vote for convening the old Commission on Communications and Transit to deal solely with the question of calendar reform.

The essential points in the Council's action, are found in the two concluding paragraphs of the Litvinoff report, printed above. Their significance may be summarized as follows:

(1) The present Commission on Communications and Transit is directed to call a conference either the last week in August or the first week of September, long enough before the Council meeting in September so that its studies of calendar reform can be completed, in the light of the International Labor Conference Resolution of June, 1936, the League Council's action of January, 1937, the Chilean draft treaty transmitted to all governments by the League of Nations in March, 1937, and the answers received from various governments since that time.

(2) The Commission on Communications and Transit is to make its decisions and present them to the League Council meeting, scheduled for September 13th. At that time, it is expected that the Council will approve the report for reform and will call an international treaty-making conference on the subject, to be convened during the first quarter of the year 1938—before April 1. This would give governments sufficient time to make the necessary arrangements for adoption of the new calendar by January 1, 1939.

Whole-hearted cooperation in the united effort to make the League's calendar reform program move forward with promptness and dispatch has been given by M. Avenol, Secretary-General of the League, and by M. Watier, newly appointed director of the Commission on Communications and Transit. Their plans have had the strong support also of Senator Godart of France and several representatives of the South American republics.

NEW LEADER AT GENEVA

By RAYMOND MAGE

*Secretary-General of the International Committee of Cooperation on
Calendar Reform, Geneva.*

AUTHOR'S NOTE—Readers of the *Journal of Calendar Reform* are naturally interested in P. H. Watier, the new director of the Transit and Communications Organization of the League of Nations. Upon M. Watier rests the responsibility of guidance in the international development of calendar revision. In this article I have endeavored somewhat informally to tell something of M. Watier's notable career in public service and also my personal impressions from recent contacts with him in Geneva.

SINCE M. Watier entered upon his new duties, I have had occasion to call upon him several times in regard to international developments in calendar reform, which have been occupying the attention of the League's Commission on Communications and Transit for fourteen years. M. Watier has always been ready to receive me, whatever pressing business might be before him. His generosity and amiability, his kindly approach and open-mindedness are attributes that will win him hosts of friends from many lands, of many professions and of many activities.

He is very proud of the city of his birth, Bourbonne-les-Bains, site of a Haute Marne thermal spring whose curative, fracture-healing waters have been used since the days of the Romans. After the war, thousands of wounded soldiers were benefited there and today victims of civil accidents throughout France are brought to convalesce under this healing influence.

M. Watier, like many successful men, is extremely modest—so modest that the greater part of the following details of his career were gleaned from other sources. In the introduction to *Les Ports Maritimes Français*, M. Watier writes briefly about his school days, and says that as a boy his imagination and patriotism were kindled by reading in his elementary geography the following sentence: "There is no other nation so well dotted with natural ports than France." He determined that in these seaports he would find his life-work, and from boyhood he began to prepare himself for such a career.

At 22 years of age, in 1905, he left the *Ecole Polytechnique* to take a four-year advanced course of engineering at the *Ecole des Ponts et Chaussées* in Paris. His first appointment was as engineer of the Port of Nantes, and for another four years M. Watier devoted himself to the improvement of the Maritimes Loire. From 1913 to 1920 he was engineer at the port of Rouen, where the World War immersed him in vast problems and labors. His post-war promotion was rapid. For two years he was Chief Engineer of the Department of Loire, then Chief Engineer of Navi-

gation for the Seine at Paris. Finally, at the early age of forty, in 1923, he was appointed General Director of the Navigable Waterways and Maritime Ports of France. Three years later, while still holding office in the Ministry of Public Works, M. Watier was named *Conseiller d'Etat*.

For the past 14 years, M. Watier has directed all public works in connection with the ports and waterways of France. No previous director ever held this difficult post for so long a time. During this period, he has expended five billion francs in modernizing French waterways and seaports. Hundreds of millions of cubic yards of sand have gone through his dredges and vast quantities of steel and mortar have gone into his docks and harbor works. Clean cut monuments of smooth concrete, acres in extent, stand as a testimonial to his efficiency and enthusiasm. The total dredging under his direction equals the volume of a cube larger than twice the height of the Eiffel Tower or twice the length of the Normandie.

His particular study has been the great trans-Atlantic ports, such as Cherbourg and Havre. The post-war improvements in both these great harbors are well known to all transatlantic travelers. Today Havre boasts of being "the most beautiful port in Europe—home of the most beautiful liner in the world, the Normandie."

The dock where the Normandie lands its passengers is still unique in all the world. Here the gigantic liner can tie up and pull away without the aid of tugboats, so well planned is it. It is M. Watier's greatest work, admired by engineers all over the world.

Since 1923, M. Watier has been working with the League of Nations as a member of the Permanent Committee of Ports and Maritime Navigation. He was a member of the League's Committee for the Port of Bangkok, Technical Collaborator for the League on China, a member of the League's mission to Poland, and president of the League's Technical Committee on Buoyage and the Lighting of Coasts.

On February 15, 1937, M. Watier entered upon his new post as Director of the Communications and Transit Organization of the League of Nations. Among the questions awaiting his attention was the pressing problem of calendar reform. With honest frankness he did not conceal the fact that he had not yet had an opportunity to study fully this question. But he was soon able to state, as his position in the matter: "The 1931 Conference proved that the present calendar does not answer the needs of modern life. The Transit Organization has been extremely busy since that Conference studying projects which have been submitted. At the present time the Organization has before it the resolutions of the International Labor Conferences of Santiago and of Geneva and the decision of the League Council. The Transit Organization is pushing forward *as rapidly as possible* with the work and studies which have been delegated to it, with the firm desire to follow out the wishes of these Assemblies."

A CHILEAN INITIATIVE

From the Official Bulletin of the Pan American Union

Chile's proposals to the League of Nations for the international enactment of The World Calendar win the official recognition of the powerful Pan American Union in the June issue of the Union's *Bulletin*, under the title "A Chilean Initiative Towards Calendar Reform." Although most of the text of the *Bulletin's* announcement is already familiar to readers of the *Journal of Calendar Reform*, it is textually reprinted here in full, because of its historical and legislative importance.

IN THE ECONOMIC, social and religious fields there is a growing awareness of the inadequacy of our present calendar, because of its annoying irregularities and confusing changes. People who must constantly deal with accurate calculations, important engagements and planning for the future find these things complicated by the use of an exceedingly antiquated calendar.

To the average citizen, accustomed as he is to the familiar Gregorian year, the awkwardness of the irregular and changeable calendar is not always immediately apparent. However, with the development of an industrial age, with the closer inter-communication between nations, and with the wide demand among churchmen for a fixed Easter, it becomes increasingly clear that our inconvenient calendar brings real and unnecessary hardships.

The inequalities of the quarter and half-year divisions, and the annual differences between the weekday arrangement of the same months, are matters which call for adjustment. In a world which must guide itself increasingly by accurate comparisons, our present calendar is unnecessarily difficult and inefficient. We find upon investigation that our erratic calendar is the cause of errors which, in sum total, are costly and unnecessary. These errors and inconsistencies of the calendar draw upon man's time, effort, labor and even money, which might be better applied to more worthwhile purposes.

The object of calendar reform is to remove needless complications and to simplify, regularize and stabilize our time system, so that it will adequately meet our modern conditions. The reform must respond impartially to the needs of industry, government, agriculture, science, religion, social life, education and all other phases of activity. No part of our human existence is free of the calendar—we are inexorably bound to it.

Several systems have been proposed. "The World Calendar" rearranges the length of the familiar 12 months, equalizes the quarters and makes the calendar perpetual, every year the same. Equalization of the quarters is accomplished by giving the first month of every quarter 31 days and each

of the remaining two months 30 days. Thus the 12-month year has four months of 31 days and eight months of 30 days. Every month has exactly 26 weekdays. "Year-end Day" follows December 30 every year, and "Leap-year Day" follows June 30 in leap years.

A decimal system has been suggested, and a 13-month calendar has its advocates, with the introduction of an additional month "Sol". Another proposal suggests a "leap week" calendar in which every five or six years an additional week is introduced, making a long year of 371 days.

Agreement upon calendar reform, however, is rapidly becoming an international fact. It has the cooperative approval of the League of Nations and of many governmental and semi-official agencies.

To put calendar reform into actual operation, it is obvious that some kind of an international agreement must be secured. No single nation can act alone.

As there exists no national prejudice, no special interest, and no political bias against calendar revision, there would appear to be no reason why all nations, parties and peoples cannot unite amicably in its accomplishment. In fact, it has frequently been pointed out that the movement for a new calendar exercises a world-wide influence in the direction of international cooperation and world unity.

At the session of the Council of the League of Nations held on January 25, 1937, Señor don Augustín Edwards, representative of Chile on the Council and Ambassador of his country in Great Britain, introduced a draft convention on calendar reform with the following words:

Mr. President, the question of calendar reform has for a very long period been the subject of discussions both in official gatherings and in private bodies. As far as the League is concerned, you will recall that the 1931 Conference, five years ago, during which this question was considered in all its extent, was one such occasion. Forty-four States were officially represented at that conference; but at that time (which was already some time ago) the movement in favour of calendar reform had not developed in the way it has to-day, and international official bodies had not yet expressed their views. You all have before you the Report by M. Litvinoff and also the communication from the Governing Body of the International Labour Office. I shall not dwell upon the past; I will confine myself to recalling very briefly the chief facts which, during 1936, have shown the progress that has taken place with regard to the idea of reform of the present Gregorian calendar.

In the first place there is the resolution adopted by the Labour Conference of American States which met at Santiago de Chile on January 14th, 1936. After considering the work done by the Secretary-General of the League and of the International Labour Office in this matter, the Conference recommended the approval of a perpetual calendar—twelve months with equal quarters—and requested the Governing Body of the International Labour Office to transmit copies of the resolution in question, both to the Secretary-General of the League and to the Governments of all American States. Then, in June 1936, we find the resolution unanimously adopted by the Twentieth Session of the International Labour Conference, on the proposal of the Chilean Delegation.

The conclusion of the proposal was that the Governing Body of the International Labour Office was asked to draw the attention of the Council of the League to the question of calendar reform, and at the same time to request the Council to recommend that

the Advisory and Technical Committee for Communications and Transit should very carefully pursue the study of the whole of this question.

This resolution further requested that copies should be sent to the Secretary-General of the League and to States-Members and non-Members of the International Labour Organisation.

In addition to these resolutions adopted by official assemblies and gatherings attended by State delegates, my attention has been drawn particularly to the resolutions adopted by bodies which, although private in character, are none the less important both from the point of view of the objects they propose to achieve and also from that of the persons who are members of such bodies. For example, the Federation of Chambers of Commerce of the British Empire at a plenary meeting at the Fourteenth Congress held at Wellington, New Zealand, in October 1936, unanimously adopted a resolution in which the Federation urges the adoption of the perpetual calendar with twelve months with equal quarters of ninety-one days each.

I could easily give you further examples, but our time is valuable; I would merely stress the fact that since 1931 (the date of the international conference which dealt with the question of calendar reform) popular opinion throughout the world has increasingly shown its sympathy towards reform of the present Gregorian calendar. We see that the most varying movements—religious movements including Catholic, Protestant and Orthodox,—as well as workers and employers, all show an ever-increasing interest in favour of the reform of the Gregorian calendar.

Members of the Council are aware of the fact that the Chilean Government is particularly interested in this question. It was the Chilean Government which submitted in 1936 to the Conference at Santiago, and also to the International Labour Conference in the same year, resolutions the texts of which were adopted and which have been communicated to you. To-day, on behalf of my Government, I have the honour to lay before the Council a draft convention which I would ask you to consider as a contribution made by my country to the proposed study on calendar reform. This draft convention will, I am sure, receive the attention of the competent organs of the League, and will be examined with all the interest that it deserves.

I would point out the necessity for the League's continuing this study with some speed. As the texts submitted to you show, the nearest date for the adoption of the universal calendar is Sunday, January 1, 1939; and in these circumstances it is important that during the present year, Governments should be in a position to undertake the examination of a draft convention which the Secretariat should be asked to submit to them. As you will realise, the reform of the present calendar will be useful only if it is applied—if not by all countries in the world—at least by almost all. Hence it is necessary that an international convention should be drawn up, and this should be the work of a diplomatic conference. It is with this result in view that I have the honour to propose to the Council that it should request the Secretary-General to undertake an enquiry from Governments with a view to learning their views and that it should ask them to submit their observations and considerations. The results of this enquiry should be embodied in a report which the Secretary-General would submit to the Council at the appropriate moment. On the basis of the observations made by Governments, the Council would then be able to decide whether or not to convene a diplomatic conference, and could convene such a conference if it proved necessary with a view to drawing up a convention for the reform of the calendar after the necessary studies and consultations have been carried out.

The draft convention, which is appended, was referred to the Advisory and Technical Committee for Communications and Transit, at the same time being brought to the notice of the Governments.

PROJECT OF CONVENTION

The High Contracting Parties,

Considering that it is widely recognised that the present calendar is unsatisfactory in its application to economic, social and religious matters, and that recent studies, investigations and

information have shown the existence of a desire to bring about its revision;

Whereas a reform of the calendar, based upon a scheme comprising twelve months and equal quarters, would be extremely convenient for commercial and business life and would enhance the welfare of the working classes, and would be very advantageous for all nations, Have appointed the following plenipotentiaries to consider a convention to reform the Gregorian calendar:

Who, after having communicated to each other their full powers, found in good and due form, have agreed upon the following provisions:

ARTICLE I.—The High Contracting Parties hereby decide to put into effect, in their respective territories, as from January 1st, 1939, the perpetual calendar of twelve months and equal quarters, known as The World Calendar, which forms an appendix to this Convention.

ARTICLE II.—The present Convention shall be ratified and the ratifications thereof shall be deposited with the Secretariat of the League of Nations not later than December 1st, 1938.

ARTICLE III.—The present Convention shall not come into force in respect of the States which have ratified it unless, on the date mentioned in Article I, the instruments of ratification or accession have been deposited at the Secretariat by three-quarters of the total number of States Members of the League of Nations and of non-member States to which the Council shall have communicated a copy of the present Convention.

ARTICLE IV.—The present Convention shall be open for signature by the States mentioned in Article III until . . . From that date onward, the above-mentioned States may accede to it by depositing their instruments of accession with the Secretary-General of the League of Nations. The Secretary-General of the League of Nations shall notify the above-mentioned States of the ratifications and accessions received.

Done in duplicate in French and English, the originals to be deposited in the archives of the Secretariat of the League of Nations, which shall communicate certified true copies thereof to all States members of the League and to the non-member States referred to in article III.

OBITUARY NOTES

ARTHUR WILLIAMS, former vice-president of the New York Edison Company and a pioneer in electrical development, died on April 14. Mr. Williams had long been interested in calendar reform, and took an active part in the studies made by the Chamber of Commerce of New York. "This movement," he said, "will eventually meet unanimous endorsement, nationally and internationally."

EDWARD BELDEN MERRILL, Canadian electrical engineer, died on January 9. A member of both the Rational Calendar Association of Canada and The World Calendar Association, he had been internationally active in calendar revision.

GEORGE F. BAKER, head of the First National Bank of New York City, and a director in many industrial, educational and philanthropic enterprises, died on May 30. He had been an active advocate of The World Calendar for several years. "The suggested reform appeals to me," he wrote in 1934. "I have consulted with others whose confidence I have, with the idea of finding how the proposed calendar would appeal to business. The reaction I get is that it seems to be a real improvement, that there is apparently no disadvantage in its adoption, that on the contrary it would seem advantageous to business."

MORGAN J. O'BRIEN, former Presiding Justice of the Appellate Division of the Supreme Court of New York and a prominent Catholic layman, died on June 16. He had long been interested in calendar reform from the viewpoint of the Church.

OTHER deaths among the membership of The World Calendar Association during the past few months include: *Elihu Root*, former Secretary of State and Secretary of War; *Charles Hayden*, senior partner of Hayden, Stone and Company, bankers; *Richard A. Strong*, a leader in the American Woolen Industry, vice-president and treasurer of the Boys' Club; *William M. Wheeler*, Harvard Professor and an international figure in natural science; *Dr. Julius Oscar Stieglitz*, head of the Department of Chemistry at the University of Chicago; *Dr. Herbert Shenton*, Professor of Sociology at Syracuse University; *Dr. R. Harlan McCartney*, prominent Pennsylvania clergyman; *Dr. James S. Luckey*, president of Houghton College; *F. B. Balzar*, former Governor of Nevada; *George W. Jacobs*, bookdealer, chairman of an active calendar reform group in Philadelphia; *Ambrose Swasey*, scientist and manufacturer of telescopes for Lick Observatory, Yerkes Observatory and other famous observatories.

FRANCE URGES SPEEDY ACTION

By SENATOR JUSTIN GODART

French Government delegate to the International Labor Office, Geneva

(Translation of a radio address from Geneva, Switzerland, June, 1937)

PERMIT me to point out briefly the advantages which The World Calendar will bring to our civilization and the reasons for which more and more, this project is accorded an intelligent adherence.

A perpetual calendar of 12 months, identical every year, and always beginning on Sunday, January 1, will bring a stability and order for which we have great need in the yearly time-reckoning of today. In fact, the inconvenience of our present wandering calendar is the cause of the innumerable confusions that instability always brings with it. In the new perpetual World Calendar, January will always correspond with past and future Januarys, February with past and future Februarys, the same strictly corresponding order being repeated in the other months.

The law and order which the new calendar institutes, will bring certain advantages which will obviously benefit our daily life. Throughout the world, for example, the computation of interest, loans and accounts will be simplified and also the result will be more equitable, because of the better distribution of days, months and other divisions of the year into more strictly equal parts. The business world will see that each month will not only have exactly 26 working days, but also a regular number of Mondays, Tuesdays, Wednesdays, and so forth, and because of this it will be easier to compare, compute, and study in a precise manner all monthly, quarterly and annual reports. Statisticians will no longer be obliged to resort to laborious and complicated "adjustments" to explain why the month of March in one year has a poorer percentage of business than the corresponding month of another year. The cause of these inconsistencies in the past has frequently been not poor business or faulty management, but the stupid and wholly unreasonable differences of the calendar.

Universities and schools will be able, once and for all, to arrange their study schedules and to fix their vacational periods on as stable and practical a basis of time-taking as our clocks. The clock invites the schoolmaster, when it is eight o'clock, to open his classes, when it is noon, to have a recess, and when it is five o'clock, to close the school for the day. Under the new calendar, he will, in a like manner, know the exact day of the week and the date of the month marking the beginning of each semester, the beginning and end of vacations, and arrangement of the study curriculum.

Families and homes will rejoice at the easy planning and preparation of vacations and the joyful celebration of national holidays if they always fall on Monday or Friday and are, therefore, the occasion of a prolonged

week-end period. In the social world engagement dates will be more easily made and remembered if, for example, January first is always Sunday, March 15th always Friday, or August first always Wednesday.

This will facilitate the fixation of dates for lectures, concerts, national and international conferences, opening nights in theaters, sports events, and other engagements which must be planned a year in advance. And for many family budgets, the knowledge of the exact day of the week when the monthly or semi-monthly pay envelope is due will in itself be a welcome item of calendar reform.

The greatest advantage, perhaps, of all these things, which will come from the new and perpetual calendar, lies in the fact that the various time-units such as the day, the week, the month, and the season, will no longer pull away from each other in indescribable confusion, but will cooperate with each other in harmony and will constitute a complete synchronization. This perfect adjustment is the most characteristic trait of the new reform, which is thus assured of the support of all those who desire a greater unity, a better equality and a more perfect order in daily life.

The extra day which comes at the end of every year—the Year-End Day, December 31—and the other extra day inserted every leap year—the Leap-Year Day, June 31—are considered holidays and do not interfere with our daily activities. They offer a welcome respite from the natural routine with which our life is encompassed.

Speaking about holidays, calendar reformers believe that national holidays are matters for each nation's decision. Religious holidays belong within the domain of the churches. Advocates of calendar reform are keenly desirous of improving the present civil calendar so that it may better serve mankind in its manifold daily activities. They hope, that, in the matter of the stabilization of Easter and other feast days, the churches will come together in harmonious agreement and consequently facilitate for mankind the determination of these days. But we repeat that this problem is a religious and not a civil question and will not have a place in the forthcoming international conference.

Calendar reform has been placed in the hands of the League of Nations and the League's continuous activity should bring The World Calendar to a successful culmination by January 1, 1939. Enactment of the proposed revision on this date is important as the old and the new calendars simultaneously begin in 1939 on the same day, a Sunday, and on the same date, January 1, which happy combination does not occur again until eleven years, 1950. Consequently it is natural that the League of Nations should strive to adopt the new calendar now.

But to do this the League must have the cooperation of its States Members and non-members. It is urgent then that all the governments which have received the communication of the League on this matter should reply favorably and promptly. All the slight divergencies of opinion which may exist, regarding the Draft Convention text, can be easily smoothed out at the meeting of the Transit Commission, scheduled for September, or at an International Conference to be called for that purpose.

That is why, when I address government delegates and public opinion which must influence them, I seek to convince all my hearers of the necessity of a prompt and favorable decision through an international conference to be called as soon as possible. The convening of such a conference in the course of the first quarter of 1938 would allow governments sufficient time to enact the new calendar, so that it could come into force in 1939.

EDUCATION VOTES APPROVAL

Official Report of the Committee on Calendar Reform of the National Education Association, Approved at the Detroit Convention, July 1, 1937.

By MARGARET M. ROCK, Chairman

A year ago the National Education Association appointed a committee of Educators, under the chairmanship of Miss Rock (Bridgeport, Conn.), to study calendar reform and report at the 1937 convention in Detroit. The comprehensive and scholarly report which was submitted is presented below. It was received and approved by the Representative Assembly of the Association in the following "endorsement" passed by the Detroit Convention on July 1: "*The National Education Association endorses the movement for a simplified calendar as proposed by the Council of the League of Nations. The Association recommends that the members be kept informed as to the latest developments in the progress of this movement for a World Calendar.*"

AS CHAIRMAN of the Sub-committee appointed by the Resolutions Committee of the National Education Association, to consider and report upon proposals to reform the Calendar, I hereby present the results of our inquiries and a recommendation based thereupon.

The measurement of time is among the original activities of man's mind and the calendars of which we have record, religious, civil, national and local, are numerous. The Calendar in general use is named after Pope Gregory XIII and is known, therefore, as the Gregorian Calendar. This is the Calendar that we have had to take into consideration.

There is no doubt as to the value of the Calendar. This value is demonstrated by the fact that it has superseded or is rapidly superseding all other calendars throughout the world. Education in the true meaning of the word is among the universals which transcend the boundaries of race, religion and sovereignty. It is the spirit of education that we have tried to apply to a problem of measuring time that has now to be solved for mankind as a whole.

For many years, there has been an examination of the question what would be an ideal calendar. In an arithmetical sense no such ideal is possible. The day is founded on the revolution of the earth about its axis. The year is founded on the revolution of the revolving earth about the sun. Astronomy lays down the edict that there can never be a calendar in which such a year will include an exact number of such days.

EDITOR'S NOTE.—American delegates to the Tokyo meeting of the World Federation of Education Associations, which convenes during the early part of August, 1937, will present Miss Rock's report and the endorsement of the Detroit convention for international approval at Tokyo. The official organ of the World Federation has already approved of The World Calendar in an article reprinted in the December, 1936, issue of the *Journal of Calendar Reform*. The World Federation is under the presidency of Prof. Paul Monroe of Teacher's College, Columbia University. Its Secretary-General is Prof. Uel W. Lamkin of Maryville, Mo.

The excellence of the Gregorian Calendar is due to a close approximation to the ideal. The year of 365 days with 97 leap years of 366 days in every four centuries furnishes what, for all practical purposes, is a precise solar year. The Gregorian Year is thus associated accurately with the solstices and equinoxes which mark the length of sun and shadow in a day of 24 hours and accompanying succession of the seasons. No change is now or is likely ever to be proposed in the length of this calendrical year as a whole. The year in its totality embodies a satisfactory answer to the preliminary question—what shall be the comprehensive unit of time.

Within the structure of the year, there are certain anomalies and inconveniences. As long as society even in western countries was largely illiterate, these irregularities chiefly concerned a small and leisured class which was itself an expression of inequality. With the spread of education, the Calendar has been claimed by the community as a whole. It is used, day by day, by more and more people for constantly multiplying purposes, statistical, economic, social. This growing volume of use means that the Calendar has a greater importance today than at any period in human history and that imperfections in the Calendar embarrass an ever-extending range of affairs. Arguments for adjusting the imperfections thus accumulate and each as it arises adds momentum to the others.

The movement in favor of Calendar Reform arises out of the conviction that what is essential to man ought to be the best that the mind of man can conceive. This movement has been growing for years, and the question is now whether the National Education Association shall appear among many public bodies, including the League of Nations, which have Calendar Reform under sympathetic consideration. Our broad recommendation is that the Association would be well advised to express such an approach to what has become an immediate situation.

The question to be considered is simple. What is the best way of dividing a year of 365 or 366 days into smaller periods—that is, months and weeks. In dealing with this question, it is unnecessary and might be confusing if we were to expound the many proposals which, at this present date, manifestly lie outside the range of practical politics. What we have to present to the Association is the considered result of prolonged study by experts—scientists, scholars and men of affairs—who have analysed various plans and arrived at a great measure of agreement as to what reforms of the Calendar are expedient and possible. It is only towards such a consensus of opinion that, it seems to us, the Association might suitably indicate its attitude.

The number of days in the Calendrical Year is either 365 or 366. Neither of those numbers is divisible into convenient factors. Arithmetic shows that $365 = 5 \times 73$ and that $366 = 3 \times 2 \times 61$. It is thus seen that these years cannot be divided into an exact number of 7-day weeks, or into an exact number of months and quarters.

The perplexity to be resolved is not new. In Egypt—to mention a country with a culture that has affected our own, especially in chronometrical matters—the difficulty was met by treating the year of months as 360

days. This gave 12 months of 30 days apiece. The other 5 days, described as "epagomenal" or extra-monthly, were dedicated to religion. There was no provision for fitting in a 7-day week.

A less drastic and more comprehensive adjustment than this is now proposed. The year is treated as consisting of 364 days within the months and one day, the 365th day, outside the months, or two extra-monthly days, including the 366th, in Leap Year. The single day is set between the last of December and the first of January. It is known as Year or Year-End Day. The additional day for Leap Year is set between the last of June and the first of July. It is known as Leap or Leap-Year Day.

The adoption of this proposal would greatly simplify the year. The numeral 364 is divisible as follows: 2×182 ; 4×91 ; 7×52 ; 13×28 .

First, it will be seen that the year contains exactly 52 weeks of 7 days. This means that the so-called wandering week is abolished. At present, successive years begin on successive days—a Monday, a Tuesday and so on, skipping a day after Leap Year. For the future each day of every year would be the same day of the week. The Calendar would be perpetual.

Secondly, the months are rearranged. At present, they are as follows:

January, March, May, July, August, October, December—31 days.

April, June, September, November—30 days.

February 28 or 29 days.

This irregularity, due to remote susceptibilities in the Roman Empire under Augustus Caesar, is corrected, and the months like the year as a whole are made perpetual.

The Thirteen-Month Calendar provides for thirteen months each of exactly four weeks, and these months are identical, each with the others, in every respect. This Calendar, which originated with Auguste Comte, has been considered with sympathy in certain quarters and adopted by certain concerns for the payment of wages. Our function is, we think, sufficiently fulfilled if we report that after investigation at Geneva and elsewhere, the Thirteen-Month Calendar has been held impracticable for general adoption, and that it falls, therefore, outside our terms of reference.

By a process of elimination, we thus arrive at the opinion that The World Calendar, as it is now called, is the only reform of the Gregorian Calendar on which it is useful for us to pass judgment. This Calendar divides the 364 days thus:

Two equal half-years of 182 days.

Four equal quarters of 91 days.

Each quarter to consist of corresponding months—31, 30 and 30 days.

The advantages of The World Calendar are as follows:

- (1) It abolishes the wandering week and provides for a perpetual almanac.
- (2) It retains and equalizes the half years now unequal.
- (3) It retains and equalizes the quarters, now unequal. Within each

quarter, the various time-units—the 91 days, the 13 weeks, the three months—synchronize.

(4) It regularizes the months, now irregular, and reduces their inequalities to a minimum. A discrepancy of 31 days for seven months, 30 days for four months, and 28 to 29 days for one month, would be for the future no more than a discrepancy of 31 days for four months and 30 days for eight months arranged in quarters thus.

January 31	April 31	July 31	October 31
February 30	May 30	August 30	November 30
March 30	June 30	September 30	December 30

It is generally agreed that man first measured time by the moon or lunar month of approximately, $29\frac{1}{2}$ days. The twelve lunar months contain 354 days and the persistent attempt continued over scores of centuries to coordinate lunar months with solar years has led to inextricable confusion in many ancient calendars. Of this confusion, there is the evidence that interests us here. Easter "wanders" from year to year within a long period of 35 days and the date of Easter which determines the movable feasts over one-third of the ecclesiastical year.

Great Britain has passed enabling legislation for fixing the date of Easter and the churches particularly affected are increasingly favorable to the reform. While a fixed Easter is not any part of what is specifically proposed as The World Calendar, it has to be made plain that such a perpetual Calendar is necessary to any plan for emancipating a fixed Easter from the wandering lunar month, on the one hand, and the wandering week on the other. The date usually assigned to Easter Sunday would be April 8th.

The educational year in the United States is a varied and complicated elaboration of periods and dates. The year is determined in some respects by climatic conditions. It is not the same for different institutions or categories of institutions, university, college and school. Each institution within its area has to deal in its own way with any calendar that may be in use.

We cannot but conclude, however, that the irregularities and inconveniences of the Gregorian Calendar add to our difficulties in many ways, and that it would be greatly to our advantage if these irregularities and inconveniences were eliminated from the measurement of time.

Educationally, we would be relieved of the necessity of giving instruction in the different lengths of months which have no significance for most children in our schools. The Calendar would be brought within the framework of orderly arithmetic.

A perpetual Calendar would enable us to work out our educational

almanac, not only for the year in question but for years to come. Many arrangements would be as perpetual as the Calendar itself.

The elimination of the wandering week would be a great advance in the right direction. Take the case of schools which reopen on the Tuesday after Labor Day. Reopening is now dated from September 2 to September 9 inclusive. With a World Calendar, the date of reopening would be September 5.

The task of arranging the required number of teaching days within the school year would be standardized and simplified. Holidays might sometimes intrude themselves into the middle of the week but they could not wander all over the week.

Taking two major festivals, we find that under The World Calendar they fit in with educational requirements. An Easter Sunday on April 8th will fall within the usual college vacation at that time.

Christmas would be a Monday. A Christmas vacation would thus work out at ten days minimum as follows:

Saturday December 23.

Christmas Day, Monday December 25.

Saturday December 30.

Year-End Day—the 365th day, an extra Saturday.

Sunday January 1.

There would be two week-ends at Christmas and New Year's and no split week.

We are anxious not to overload this report with detail and we omit, therefore, any specific allusion to other holidays. But it seems to be obvious that national and state anniversaries are most useful socially when they are included in a week-end. That is true also in the educational field. Any arrangements that tend to develop the long week-end in preference to the split week would be, therefore, an advantage to teaching institutions.

These are the general considerations that have led us to the opinion that the adoption of The World Calendar would be of advantage to the great enterprise of education to which we are devoting our lives. A convenient year for such adoption would be 1939, when the existing Gregorian Calendar opens with a Sunday. By a favorable resolution, we would thus be assisting the community to take advantage of an opportunity of making proper that which happens to be near at hand. The World Federation of Education Associations is meeting at Tokyo in August, and our own Association will be then represented. The Federation will consider Calendar reform from the viewpoint of International Education.

The Council of the League of Nations has a treaty in draft which provides for the introduction of The World Calendar on January 1, 1939. This treaty has been submitted to governments of States Members and non-member States of the League, and is now under the consideration of the State Department at Washington.

A NEW BOOK IN SPANISH

Reviewed by CHARLES C. SUTTER

FROM Buenos Aires comes a new book on calendar reform entitled "The Present Calendar and Its Revision in 1939." The author is a distinguished Jesuit scholar, Father Santillana, a member of the Argentine Committee on Calendar Reform. The full title of his book in Spanish, is *El Actual Calendario Juliano-Gregoriano y Su Sensacional Reforma en el Año 1939*.

The marked sympathy that has been displayed in South America toward the proposal to reform the calendar has received further impetus from the publication of this little work by a Catholic priest who has been a teacher of mathematics for a quarter of a century. His publication is also a new manifestation of the great interest which many Jesuits in different parts of the world have taken in the question of the calendar. And that is as it should be, for the Jesuits have been known almost from their foundation for their specialized studies in astronomy, meteorology and allied sciences.

Father Santillana's work is a modest, but highly enthusiastic, contribution to the ever-growing bibliography of calendar reform. It is not so much a learned treatise as a popular appeal. It takes as a spring-board a report issued last year by the Rational Calendar Association of London. Finding this report an indication that there are very good hopes for a revision of the calendar in 1939, Father Santillana launches into an almost impassioned advocacy of The World Calendar, and scatters along the way a brief history of the Gregorian calendar and of the different reform projects.

His treatment of the familiar historical details need not detain us. The work is of particular significance, however, when it touches upon the religious, and in particular on the Catholic, angles of the subject.

Father Santillana attaches much importance to the findings of the 1935 mission to Rome, headed by the famous Benedictine, Dom Cabrol. And very properly, for the authority of Dom Cabrol in liturgical and calendrical questions needs no stressing.

It is of interest to find this South American cleric also attaching much significance to the sympathetic attitude which the British Government has taken toward calendar reform. In such matters, says the author, the English people set the fashion for the rest of the world.

Another point of interest is that calendar reform is nothing new in Spanish ecclesiastical circles. Father Santillana quotes several times with high approval from a book written by Don Carlos de la Plaza y Salazar, entitled "Calendar Reform Adapted to the Feasts and Solemnities of the Church." The book was published in the ill-fated city of Bilbao, in 1912.

Father Santillana emphasizes many times that the current movement for reform has no anti-clerical or anti-religious angle, as had the reform of the French Revolution. Like all proponents of moderate reform, he thinks the 13-month scheme too radical. He divides the modern history of reform by dates into three movements. The first movement was in 1911. It featured the 12-month plan of Grosclaude and came to an end with the World War. The second movement reached its peak in 1928 and concentrated upon the 13-month calendar. The third movement is the present one, which, it is hoped, will culminate in the adoption of The World Calendar by 1939.

Our priest-author is very decided about the advantages that The World Calendar would have for ecclesiastical life. He mentions especially the simplification of the Missal and Breviary, and the better understanding of the Liturgy on the part of the laity.

There are several pleas in the book for the creation of a definite and clear public opinion. "Not enough people know about the proposals," he says, "or about the advantages connected with them. Such a state of affairs also exists among many of the clergy; and only a vigorous campaign of enlightenment can eliminate it."

As an example of the vigor with which Father Santillana propounds his thesis, one may take the concluding sentences of his introduction:

"We must face the problem that confronts us—a problem that is quite definite, vastly important and strongly insistent. We must face it with calm determination and clear convictions. We must realize the necessity of solving it quickly and finally. And, at the same time, we must remain confident, with a confidence based on solid grounds, that very shortly this new plan will become a reality, and we shall have to accept the year of twelve months and four equal quarters as a part of our daily lives."

Or the following from his closing pages: "This has been written with the sole aim of helping to create correct opinions about calendar reform. I will now leave the reader to form his own conclusions on the arguments that support calendar reform, the advantages it offers, and the chances it has of being adopted. If he finds himself convinced, may he become a sincere and enthusiastic supporter!"

This attractive little book from Buenos Aires is just the kind of thing that should catch the popular South American eye and should be effective in winning new adherents to the reform proposals. It gives the salient facts of its subject in clear, vigorous language. If, in the eyes of more phlegmatic northerners, the author's enthusiasm should seem to run away with him occasionally, it is certainly not for proponents of calendar reform to object. That a Catholic priest, and a Jesuit, and a seasoned teacher of calculus and trigonometry, should espouse the cause of calendar reform so wholeheartedly, is certainly a matter for rejoicing.

VATICAN VIEWPOINTS

Three Articles from Roman Catholic Authorities in the Americas and England, on the Present State of Calendar Reform

The following articles, being written from the viewpoint of distinguished churchmen in North America, South America and England, naturally deal to a considerable extent with the ecclesiastical side of calendar revision. It should be understood that the reform of the civil calendar is a question which is being enacted by governments, whereas the desirable fixation of Easter and other movable feasts, being religious in character, will be dealt with through the church.

AS SEEN IN AMERICA

By M. MASSIANI

(Written for the National Catholic Welfare Council, and published in The Catholic News and other influential Roman Catholic organs)

HOLLYWOOD! One is surprised no end to find this name in a history of the calendar down through the ages. It happens to have nothing to do with the movie capital. John of Hollywood was a Scotch monk who lived at Paris in the middle of the thirteenth century. He made a sensational discovery. He discovered that the calendar in use at his epoch was seven days behind the real date calculated according to the progress of the sun. The year, as a matter of fact, was calculated according to the Julian calendar—the calendar of Julius Caesar—at 365 days and six hours. But, in reality, its length was less. To pass from one vernal equinox to another, the sun made use of only 365 days, 5 hours, 48 minutes, 46 seconds. And this interval diminished at the rate of one-half second per century.

However, it was not Hollywood who reestablished the correct duration. It was calculated by others in the years following. But credit is due him, at least, for indicating the need for making a new calculation. In fact, this difference of 11 minutes per year between the real duration of the tropical year and the fixed duration of the calendar year would have resulted in the loss of a day in 128 years. Eventually the months would not have corresponded to the seasons and would have returned to their proper places only after a period of about 46,000 years.

It was not until three centuries later that the error was remedied under Pope Gregory XIII. It was decided to suppress 10 days—the error had become worse since Hollywood's time—and in the future that three bissextile days would be dropped in every four centuries. A curious consequence of the application of this reform has always been remembered in Spain: St. Theresa, who died on Oct. 4, 1582, was buried the following

day, which was found to be Oct. 15. . . . This is one of the odd, also bewildering, ideas that one gets from listening to the servitor of a modest parish in the diocese of Nevers: Abbe Chauve-Bertrand, pastor of St. Reverien.

This sixty-year-old pastor, who in order to work with the Benedictines lived until recently in Spain and received the sub-diaconate at Burgos, has made a specialty of all problems relating to the calendar. Unlimited knowledge is to be found within the limited precincts of the little rural rectory at St. Reverien.

We who live "from day to day" and who know the calendar, have we taken the trouble to reflect that there was a time when men did not distinguish between weeks, months or years? They perceived solely that night regularly succeeded day. They observed the variations of the lunar spectrum. They counted by moons. On the whole, this was the first calendar. Then they noticed that the seasons, annually, returned with exactitude and they tried to distinguish between them and to observe the variations of the sun rather than the renewal of the moon. They had reached the age of the solar calendar.

Long before the Christian era, the Egyptians had broken the year into 12 months of 30 days each. The Chaldeans, on their part, had divided the days into hours of 60 minutes and the minutes into 60 seconds.

There have been various calendars: Hebraic, Coptic, Hindu, Chinese, Aztec, Greek, Arabic, Roman, the Julian, then the Gregorian. Abbe Chauve-Bertrand knows them all with their special characteristics and their defects, and he has crammed some curious observations into the book which he has dedicated to them: *La Question de Paques et du Calendrier* (The Question of Easter and the Calendar).

An old story, that of calendar reform. It has been thought about for a long time.

In the 18th century Canon Ouvrard of Tours and Father Nau, a learned Jesuit, proposed certain changes so as to bring about less variation in the date of Easter. The Council of Nicaea, in 325, had fixed the date for Easter as the Sunday following the full moon after the vernal equinox; that is, after March 21. The feast falls between March 22 and April 25.

Various faults are found with this instability of Easter, which is celebrated sometimes when the snow is still falling, sometimes when the flowers are in bud. Due to this instability, certain Sundays "after the Epiphany" disappear from the missal just as in other years those "after Pentecost" are lacking. The world of education complains of the irregular and constantly varying chopping up of the school year. This instability of Easter is the chief charge against the Gregorian calendar.

Another is the great diversity in the length of the months and the division of the year into 52 weeks plus one day, which makes the first of

January and the first day of each month fall on a different day of the week from year to year, whereas certain arrangements would result in the first of January always falling on a Sunday or a Monday.

Projects for calendar reform have been extremely numerous, but it was toward the close of the 19th century and early in the 20th that the problem had been most discussed—in 1884 at the Washington International Conference on the Universal Hour, and in 1907 at the Benedictine Conference at Rome.

In 1912 a congress held at Boston decided, upon the unanimous vote of the 891 persons present, coming from 47 states, to make inquiries of the Vatican. The Holy See declared that it made no objection but invited the civil powers to enter into an accord on the reform of the civil calendar, after which it would willingly grant its collaboration in so far as the matter affected religious feasts.

Manifestations increased. As to those concerning America, let us cite the recommendations of the Pan-American Conference at Havana in 1928, inviting all the countries of the New World to take the initiative in propagating the regularization of the calendar and the fixity of Easter. That same year the National Academy of Sciences at Washington declared itself favorable to a revision of the calendar and, at the same time, George Eastman of Rochester, N. Y., founded an American committee to promote a campaign in favor of the division of the year into 13 months of 28 days.

In 1930 The World Calendar Association, founded at New York with Elisabeth Achelis as president, began editing a *Journal of Calendar Reform*.

It would be impracticable to mention all the plans that have been thought of to reform the calendar, but one that merits attention was proposed by an American Paulist, Father Searle.

So as not to derange the order of the days of the week, Father Searle would reduce the year to 364 days, or exactly 52 weeks. He would eliminate the 365th and the supplementary day of the bissextile year until there were seven which would be added at the end of December. Thus, several times in a century there would be a year of 371 days, or 53 weeks.

The plan that has met with the most approbation and is indorsed by Abbe Chauve-Bertrand is the following:

It has been proposed to divide the year into four equal quarters of 91 days each, each quarter or trimester to have a month of 31 days and two of 30 days. Each trimester would begin with a Sunday. The 365th day of the year would be set apart and would not bear the name of a week day. It might be called the "day of the year." In the bissextile year the extra day would be placed in the same fashion between June 30 and July 1 and would not bear the name of any day of the week.

As to Easter, the date that has received the most support is the second Sunday in April. If the calendar should be reformed as proposed, the first

of April would always fall on a Sunday, therefore Easter would fall invariably on April 8.

What is the attitude of the Catholic Church with respect to the various suggestions? The Church appears to be by no means irreconcilable.

The first observation made is that the Gregorian calendar, now in use, is not specifically Christian. It is the reproduction, slightly modified, of the calendar of Julius Caesar.

Up to the Council of Nicaea the Christians had celebrated Easter on different dates, according to the sections of the world in which they lived. If the council adopted the fixation of Easter to the extent of selecting the Sunday following the full moon of the vernal equinox, it was only for the purpose of unifying the celebration. But there was no reason of a symbolic or historic nature affecting the decision.

In 1896, at the request of Herr Foerster, director of the Berlin Observatory and president of the International Committee on Measures, Cardinal Rampolla, at that time Under-Secretary of State at the Holy See, said that if the stabilization of Easter were demanded universally it would be taken under consideration by the Holy See in general council; if it were not of universal accord it would not be considered since it is not the desire of the Holy See to create new divisions in Christianity.

Abbe Chauve-Bertrand assures that, in 1913, Pius X, favorably considered the eventuality of a calendar reform which would be affected by common accord between the governments and the Church.

In 1924 the Most Rev. Luigi Maglione, then Nuncio at Berne, wrote to a commission of the League of Nations that the eventual modification of the feast of Easter would not present any dogmatic difficulty; however, it would be a question of abandoning traditions strongly established, to depart from which would be neither legitimate nor desirable without grave reasons of universal interest. If it were demonstrated that the general good demanded certain changes in these traditions, the Holy See would not wish to examine the question without the expressed wish of an ecumenical council.

In 1935, after certain large associations, including The World Calendar Association of New York, had sent to the Holy See a memorandum on the necessary reforms, the *Journal of Calendar Reform* presented the following results of the inquiry made at Rome:

1. The Vatican constantly follows the calendar reform movement throughout the world.
2. The stabilization of Easter cannot be detached from general reform.
3. It is desirable that unity be established between those who demand reform or that all, or at least an important majority, favor one system.
4. Complete accord on a definite method of revision must have the formal approbation of governments. If the nations should present a request to the Holy See that it examine the question, it is probable that this request would be received with favor. But

until an accord had been reached it would be premature to attempt to obtain an official decision from the Holy Father.

5. It is desirable that it be shown that the demand for a calendar reform is not supported by various interests, but is general and universal.

6. The opinion of the Vatican is in favor of the system of 12 months and opposed to the 13-month year.

It is indicated that, from the religious viewpoint, the reform of the calendar and the changing of the date for Easter do not meet with any insurmountable difficulty.

Abbe Chauve-Bertrand remarks that if it is decided to change the calendar it would be advantageous to do so on Jan. 1, 1939, which will fall on a Sunday. This coincidence would limit to a minimum the inconveniences of a change. After that, it would be necessary to wait until 1950.

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AS SEEN IN SOUTH AMERICA

By the Most Reverend Valentin Panzarasa

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IN DEALING with the subject of a more logical and more advantageous calendar, we do not speak of returning to the impieties and incoherencies of the calendar of the French Revolution. No; we deal rather with proposals which are not only useful, but which also are entirely in accord with ecclesiastical requirements and which promise desirable advantages alike to the religious and civil life of humanity.

As we all know, the calendar used almost universally today is the Julian, reformed by Pope Gregory XIII and effective since October, 1582. If we look at the calendar clearly, we are not long in finding its various defects, not so much in discord with the astronomical year as in relation to our civil and religious life. Here are some of these defects:

(1) *Inequality of the number of days in each month.* What reasonable motives could induce us to give February 28 days (except in leap year), other months 30 days and others 31? Greater uniformity in the number of days in each month would obviously be advantageous for statistical work, for payments and for many other human activities.

(2) *Irregularity of Easter Day.* Easter can fall on any day at all, between March 22 and April 25. Why so much mobility in the date of Easter, with its retinue of all the movable holidays? Would it not be more logical to fix the date of Easter on a set day—one which would be, as near as possible to the day on which the Lord really made his resurrection?

(3) *Other irregularities in the church calendar.* Fixation of Easter would bring to an end many present liturgical concurrences and conflicts. It would also remedy the superpositions of religious holidays and temporal

holidays. It would make the use of the Missal and the Breviary less complicated for both priests and worshippers.

(4) *Irregularities of weekdays.* The odd fact that in successive years the anniversary of any event does not fall on the same weekday is a situation which can be remedied with comparative ease. Countless examples of the present irregularity will occur to any reader. For example, last year a boy made his first Communion on Holy Thursday, but this year the anniversary of that Thursday does not fall on the same day of the month as last year. Last year a wedding was celebrated on Sunday, but the first anniversary of the wedding falls on Monday. Who would not like to eliminate this inconvenience to domestic and social life?

These and other inconveniences have brought about the present agitation for a better calendar, a definite arrangement and a "perpetual" calendar. In recent times two principal projects for revision have had their defenders. The 13-month plan, bolder and more revolutionary of the two projects, has been coldly received by the majority of Catholics. The two very grave difficulties that make this plan unacceptable and unpleasant are: *First*, the number 13 is indivisible so that the months can never be divided into equal groups, as is desirable when one treats of contracts for leases, or of the four seasons of the year; *Second*, the idea that the year has 12 months is so enrooted in the human mind that the number 13 is universally unacceptable.

The calendar which we propose and desire, and which would bring many advantages, is the one contained in the second project, which has lately been restudied, perfected and warmly advocated by our distinguished South American scientist, Dr. Ismael Gajardo Reyes. Here are the principal characteristics of the proposal:

- (1) All the years and all the quarter-years begin on Sunday and end on Saturday.
- (2) All the quarters have 91 days; the first month of each quarter having 31, and the other two 30 each.
- (3) The 365th day, which does not come into the weekday arrangement, will be called "Year-End Day," or "Day of Peace."
- (4) In leap years the extra day will be placed after June 30, and will be called "Leap Year Day."
- (5) Easter will be fixed on the same day for every year, which will coincide as nearly as possible with the true date of the Resurrection of the Lord. The eighth of April is proposed, and the Holy See will decide on what seems best.
- (6) The Reform should begin in the year 1939, for that year begins on Sunday.

Advantages of this calendar for civil life may be summed up as follows:

- (1) Months become as nearly as possible equal in length, and the numbering of days is made easy and simple.
- (2) Each month has an equal number of working days.
- (3) Every holiday, every national anniversary or domestic anniversary falls on the same weekday in succeeding years.
- (4) Easter being fixed, all other religious feasts fall every year on the same day of week and month.

(5) No longer will it be necessary to change the calendar each year. This one will be perpetual.

(6) With Easter fixed, colleges and schools will be able to redivide to greater advantage their periods of scholastic work.

(7) Statistical work, labor contracts, wages, and income from industries in equal periods of time, will be more uniform, more objective, and more equitable.

Advantages for religious life may be similarly catalogued:

(1) The new calendar will simplify the structure and use of the Missal. Under the present calendar, this book of ours is composed in three principal parts: the Proper of the Seasons, the Ordinary of the Mass, and the Proper of the Saints. With the reform will come the fusion of the two Propers into one, with all the masses successive, according to the days of the year, saving the priest from the distraction and preoccupation of searching here and there for the commemoration of the Saint, or of the Vigil, or the Feast, the Final Gospel, etc.

(2) It will simplify to a great extent the use, and will reduce the volume and cost of our Breviary. Consider the large technical introduction concerning the calendar and the occurrence and concurrence of holidays. It can henceforth be incorporated in the History of the Breviary. Elimination of the oscillation of Easter does away with many repetitions of the Propers of the Saints in separate volumes. Because of this, a more convenient and cheaper Breviary is made possible.

(3) The Missal and Breviary for the Faithful, which should be used each day for the illumination and nourishment of the Christian spirit through the Liturgy, so that the Faithful may be able to participate more intimately with the priest in the Holy Mass and in the prayer of the Divine Office, is today a very difficult problem for the majority of the Faithful. To keep clearly in mind the mass of the day, with the commemoration of the occasion, is no slight task. Calendar reform does away with all these difficulties. The Faithful need only to look at the date of the month, and immediately the Missal and the Breviary will be entirely clear. This alone is enough to make all churchmen desire the new calendar.

(4) The priest who today, through any accident whatsoever, has lost or forgotten the liturgical calendar, cannot always conveniently and surely arrange the prayers of his Mass or his Office; we know also that the official calendars at times have errors or omissions, in spite of the care with which they are prepared.

(5) Under the present calendar, on Sundays after Pentecost, there is a separation in the readings of the third nocturne, and the first and second, because of the mobility of Easter. Likewise after the Epiphany and the XXIV Sunday of Pentecost, there sometimes remain extra Sundays which serve as liturgical repletion. With a new calendar this is remedied.

Some of my readers, to whom the proposed revision of the ecclesiastical calendar is a novelty, will say that the fixation of the date of Easter im-

plies the breaking of a thousand-year tradition in the Church and is, therefore, a very delicate matter. That is true, and no Catholic would suggest the rupture of a thousand-year-old religious tradition against the opinion of competent authority. But we have these important facts to guide us:

First: In February, 1911, the Federal Council of Berne presented the Holy Father with the same project of calendar reform which is now proposed, in order to sound out Vatican opinion. Pius X, realizing the importance and convenience of the proposals, gave the document to a high and competent ecclesiastical personage (Abbot Benedictino Dom. Fernando Cabrol, the highest authority on such matters, according to the *Univers* of Paris, March 2, 1912), for him to make a study of the question. Dom. Fernando Cabrol gathered the results of that investigation into a monograph published in 1922 in the *Revue du Clerge Francais*, adding in the form of an appendix a wide and scholarly bibliography. The movement for a new calendar appeared to be well under way, but it was interrupted, like many other things, by the cataclysm of the World War. After the War it was gradually revived by the interest of many ecclesiastical leaders, Bishops and learned Catholics, who made favorable pronouncements concerning the great advantages to be gained from Abbot Cabrol's proposals.

Second: No real obstacle to the proposed calendar reform has appeared during 26 years of discussion. When one of the foremost authorities on the matter, the same Abbot Benedictino de Farnborough, Dom. Fernando Cabrol, has repeatedly written that there is nothing in discipline, nor in doctrine, nor in the Liturgy of the Church, which is opposed to the proposed reform, how can anything else be said? The Abbé Chauve-Bertrand, also an eminent authority and a prolific writer on the subject, has just published in Paris a book, *La Question de Paques et du Calendrier*, with a preface by Dom. Cabrol, and the approbation of the Bishop of Nevers, in which he again presents in masterly prose the reasonable attitude of the Roman Church toward the present project.

Third: In 1935, a mission under Abbot Cabrol visited the Vatican to inquire again regarding the Church's attitude toward calendar reform. The mission's visit to Pope Pius XI showed "that the proposals for Calendar Reform were on the whole well looked upon by the Vatican." In order to reach a definite decision, the Vatican hopes that an even more extensive world opinion in favor of the proposal will be developed.

Fourth: This favorable world opinion has indeed developed rapidly, in part because of the governmental, scientific and commercial interest in the subject. A recent dispatch from Geneva says: "The Chilean projects for bringing calendar reform to a culmination [Chile has been the leader at the League of Nations in this matter] have been approved at Geneva by the Council of the League, and also by the International Labor Office." We may all hope that the desired Reform will soon be a reality.

The ecclesiastical personalities who are enthusiastic advocates of the movement in favor of the Rational Calendar are innumerable. In Spain, for example, they include several Bishops and the celebrated L. Rodes, Jesuit astronomer of world fame. In South America the Archbishop of Lima is interested in a Peruvian Committee for calendar reform. In Chile also, I am sure that the Chilean Clergy will do its share in favor of an event so beneficial to all Catholics and to all humanity.

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AS SEEN IN GREAT BRITAIN

(Leading Editorial in *The Universe*, a weekly magazine published in London.)

ALTERATION of the calendar so as to provide for a fixed Easter has long been a matter of general interest and, in fact, an Act of Parliament was passed in 1928 providing for this. But as the concurrence of the Church would be in practice necessary, it was provided that the Act should not be put into force till this had been secured. Accordingly, it still remains a dead letter.

The matter seems unlikely to be revived in this simple form, but rather as part of some more general calendar reform. Many schemes have been propounded, some of them revolutionary in the extreme, and of a kind which the Church would never approve, or even tolerate. But others are of a reasonable kind, useful without being revolutionary, as indeed was the reform of Pope Gregory XIII, who gave us the calendar by which we live today, Catholics and Protestants alike. The one startling innovation, of course, from the Catholic point of view, is the fixation of Easter to the same day of each year, and the abandonment of the age-long method of computation. But it is generally known by this time that no issue of Catholic dogma is involved in such a change.

A simple plan of reform supported by the Rational Calendar Association, proposes a perpetual calendar in which all dates will always fall on the same day of the week, including a fixed date for Easter Sunday. This scheme has already aroused interest in influential Catholic circles, and has the support of one of the highest authorities upon the difficult technical questions involved—Abbot Cabrol, of Farnborough.

This scheme (known as the "World Calendar") is, briefly, to make the calendar fixed and perpetual by calling the 365th day of the year a day outside the week (causing it to come between Saturday, December 30th, and Sunday, January 1st, as an extra feast-day with a special name such as "New Year's Eve"), and to make slight adjustments in the lengths of the months so that the four quarters of the year are equal, the first month

in each having thirty-one days and the other two thirty days. It is suggested that Easter should then be fixed on Sunday, April 8.

In 1935 Abbot Cabrol headed a mission to Rome on behalf of the organizations working for this reform in Europe and America, to lay the matter before the Holy Father. The Mission found that the subject is under constant consideration at the Vatican and that when the nations of the world have agreed on a desired scheme of reform, a request to the Holy Father for a pronouncement would probably be welcomed. Both the Holy Father and the Cardinal Secretary of State, Cardinal Pacelli, devoted much time and attention to Abbot Cabrol's mission.

It is, however, from the New World that the most direct pronouncement, so far, has come. This is a statement by the Apostolic Nuncio in Santiago, Mgr. Felice, to the effect that "His Holiness Pope Pius XI, finds the plan of The World Calendar very practical and convenient and sees no dogmatic objection to it or to the fixation of Easter on April 8." Such a statement has, of course, to be strictly construed; it in no way implies that the Holy See is proposing or is willing to act in the matter. It simply acknowledges the existence of certain practical conveniences, and disposes of the idea that there is any dogmatic objection.

Strong support for this change comes from Latin America on the part both of high ecclesiastical authorities and of experts on the subject. Throughout the world no less than eighteen bishops and very many clergy have joined The World Calendar Association, and the Archbishop of Cincinnati has given the Association his full support. The President of Loyola University in Los Angeles and the President of the International Catholic Truth Society are among other prominent supporters in North America.

In Europe the outstanding expression of approval for the proposals has been that of the Abbé Chauve-Bertrand of Nevers in his book *La Question de Pâques et du Calendrier*, published in Paris last summer. This scholarly work by a recognized authority on the subject carries not only the *Nihil Obstat* and *Imprimatur* of the author's See, but also a preface by Abbot Cabrol cordially recommending it both as a masterpiece of scholarship and as a judicious presentation of the arguments for reform. Other recent support includes that of the Bishop of Tortosa, in Spain, who has also secured the approval of the Cardinal-Archbishop of Tarragona.

Calendar reform and particularly the fixation of Easter are of course subjects upon which Catholic opinion is entitled to and will differ. Also, of course, they are not matters in which the Holy See will move without the gravest deliberation, as indeed was made manifest in the discussions of the abortive Easter Act. But there is no reason why Catholics interested in the matter should not speak and act freely, both themselves and in conjunction with non-Catholics. The last word remains with the Holy See, and it will not be spoken lightly or until the time is ripe.

HOW TIME IS MEASURED

By ARTHUR M. HARDING

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This is the second of a series of articles on the scientific backgrounds of man's system of measuring time. The writer is a distinguished member of the American Mathematical Society, the American Astronomical Society and the American Association for the Advancement of Science. He is the author of the most popular text book on astronomy which has been published in many years.

SOME day we inhabitants of the planet Earth will be in constant communication with the inhabitants of the other worlds which circle around the sun, and it will be necessary for us all to use the same calendar. We must then throw our present calendar overboard and choose as a unit of time some celestial cycle that is independent of all the planets, so that the time signals throughout the entire solar system will agree.

Because of the importance of the sun to the inhabitants of all the nine worlds, we might find it convenient to get our time from the same heavenly body from which we all get our heat and light. There are several solar time-cycles that might be selected. One of these is the rotation period of the sun (about 25 of our days), and another is the length of time between two successive sun-spot maxima. If we prefer to go outside of our solar system for a time-regulator for all the worlds, we might agree to use some prominent double star and choose as our time-cycle the length of time required for the revolution of the two parts of this star around their common center of gravity.

In this year 1937, we are far removed from those early days when each tribe of people could choose its own unit of time and set up its calendar in its own way. Such a system worked very well as long as there was little or no communication between the different tribes, but today the world is just one big community and the use of different time-units is simply out of the question. All nations must agree upon a unit of time and then use it. In the present movement for calendar reform it is recognized that a decision must be simultaneously reached between the great majority of civilized states, and this fact is carefully stipulated in the draft treaty which the League of Nations has submitted to all governments.

In order to measure time it is necessary to make use of some moving object. Fortunately we are well supplied with such subjects, for if there is anything in the universe that is not in motion the astronomers have not yet found it. For the convenience of all nations we naturally regulate our calendar by the motion of some heavenly body that can be seen by all of the inhabitants of the earth. In order that our measurements of time may

be accurate we must, of course, select a body whose motion is uniform.

At the present time we are satisfied to so choose our units of time-measurement that they will be entirely satisfactory to the inhabitants of the planet Earth and let those on other worlds look out for themselves, at least until we get on speaking terms with them. We, therefore, prefer to measure our time by the movement of the earth itself.

Recent researches have shown that, although the earth moves faster around the sun in winter than in summer, there are two periods of time connected with its motion which do not vary—its period of revolution around the sun and its period of rotation on its axis. If there is any variation in either of these natural units of time it is so slight that its effect will be felt only after many thousand centuries.

It is natural for the inhabitants of the earth to use their moving planet for the purpose of measuring time. We must make use of some moving object, so why not use the earth itself? We are all living on it and, of course, move with it.

We are concerned, therefore, with time as measured by the motion of the earth. If the earth were not in motion we would have no idea of time as we know it today. In fact some people predict that after billions of centuries tidal friction will have retarded the rotation of the earth to such an extent that it will continually face the sun, like the little planet Mercury now does. In that event our World will have come to an end, and time as we know it, will no longer exist.

The two units of time that modern man has chosen are called the "year" and the "day," and both are defined with reference to the sun, so that not only does the sun furnish our light and our heat and everything that we eat and wear, but we even measure our time in solar units. The year is defined as the length of time required for the earth to make one trip around the sun, and the day is the length of time required for the earth to rotate on its axis with reference to the sun. There are several different kinds of years and several kinds of days. For example, the length of time between two successive passages of the sun through the Vernal Equinox (about March 21) is not quite the same as the year we have defined above, and a day when measured by the sun is about four minutes longer than a day that is determined by the rising and setting of the stars. However, we shall not enter into a discussion of these differences here.

The lunar month is still used to a limited extent by certain races of people but this time-unit, although very important in the early history of the human race, plays no part in the calendar we use today. It is true that we divide our year into months, but these units are man-made and have no relation to the moon. About the only use we make of the moon today, in measuring time, is in the regulation of our church calendar.

It is, indeed, too bad that, although nature has given us three clocks—

the earth, the moon, and the sun—no two of them agree. If we allow the earth to measure time for us, then the moon and the sun are both wrong in their measurements. In fact, if we agree to call either of our clocks "right" then the other two are wrong. What a pity some mathematician was not consulted when the solar system was constructed! How much simpler everything would be now if he could have given a little advice before the planets and moons were set in motion.

We usually say that there are 365 days in the year, but every school boy knows that the earth rotates on its axis about $365\frac{1}{4}$ times while it is going around the sun, so that if the year begins with the British Isles on the front side of the earth, the beginning of the next year will find Chicago and St. Louis in that position. When Julius Caesar established his calendar nearly 2000 years ago, he assumed that this extra rotation of the earth during the year was *exactly* one-fourth of a turn and Pope Gregory in 1582 attempted to correct this error, but the mathematicians tell us that the year and the day can never be reconciled and that whatever calendar we use is bound to need correction after several thousand years.

If we use the moon for our clock we run into the same difficulty. The moon revolves about the earth as the earth goes around the sun, and the time from new moon to new moon—one lunation—is about $29\frac{1}{2}$ days. The Greek philosopher Meton in the fifth century B.C. discovered that 19 years are equivalent to about 235 lunar months, but unfortunately here again the agreement is not exact and there is always a little difference which makes necessary the repeated correction of any lunar calendar in order to make it agree with the sun.

How nice it would be if the earth would only turn on its axis exactly 360 times while it makes one revolution about the sun, and if the speed of the moon around the earth were so regulated that we would have exactly one lunation in 30 days! We would then have exactly 30 days in every month and exactly 12 months in every year and our three astronomical clocks would be in perfect agreement.

By revolving around the sun and spinning on its axis, the earth furnishes us two units of time—the year and the day—which are very satisfactory as far as we are concerned. Likewise each planet in the same manner provides a "year" and a "day" for its own inhabitants, if any there be. But the gigantic machine which we know as the solar system, is so constructed that no two planets have the same year or the same day, so that our time units would be of no value to inhabitants of other worlds. For example, Venus makes approximately three trips around the sun while the earth is making two trips. Consequently a man who has lived on the earth for 40 years would be about 60 years of age were he living on the planet Venus.

Let us examine the calendars that must be in use on other worlds if these "people" measure their time by the units that nature has provided for them. There is nothing more fascinating than the study of Mars through a telescope as it spins on its axis while revolving around the sun, and the length of the year and the length of the day on that planet have been determined with great accuracy. We know that the year on Mars is 686.9 of our days, that is, the earth rotates on its axis 686.9 times while Mars is making one trip around the sun, and that our clocks measure 24 hours, 37 minutes and 22.5 seconds while Mars is rotating once on its axis, but of what interest would this be to the inhabitants of Mars?

What would the Martians care about how long it takes the earth to go around the sun or to rotate on its axis? What difference would it make to them whether our clocks run fast or slow? They get their light and heat from the same furnace that supplies us, but their year, their day, and their seasons depend upon the motion of their own planet and they must of necessity make use of the calendar nature has provided for them. Their world rotates 670.2 times while making one trip around the sun so that the Martians have 670.2 days in every year. Even if they found it convenient to follow our lead and divide their day into 24 hours, their clocks would not

keep time with ours, for while the Martian clock was measuring off a period of 60 minutes, the Western Union clock would show about 61 minutes and 30 seconds.

The Martians are well supplied with lunar months—though they are too short to be of much value—for they have two moons where we have only one. Both of these moons are rather close to the planet and move around it very rapidly so that, as observed from the surface of Mars, their behavior is entirely different from that to which we are accustomed. Let us take an imaginary trip to Mars and watch these moons one at a time.

Our Martian friends have told us that the outer moon—Deimos—moves very slowly across the sky but that it changes its phases so rapidly that we will not want to believe what we see. But here we are on Mars in the Sunday evening twilight. In the west is the ruddy glow left behind by the setting sun and in the east the “full” Deimos is just rising. It climbs the sky so slowly that even after several hours it still appears low down on the horizon. But look how fast it is “waning!” Before midnight its phase has been reduced to “third quarter” and on Monday morning the glare of the rising sun erases a thin crescent moon from the eastern sky.

Before nine o’clock the sun passes Deimos and our moon is “new.” By the middle of the afternoon it has reached “first quarter” and Monday evening finds it high in the eastern sky and in the gibbous phase. Passing through the “full” phase early in the evening and slowly drifting westward through the long hours of the night, Tuesday morning finds Deimos at “third quarter” and almost hanging on the meridian.

Again the brilliant rays of the sun outshine the reflected light of the moon, but Deimos goes on through its phases, becoming “new” again when the sun passes it in the middle of the afternoon, and at sunset a crescent moon floats high in the western sky. Slowly Deimos falls toward the horizon through the night and at daybreak on Wednesday a full moon shines low in the west, but before it reaches “third quarter” Deimos drops below the horizon, not to be seen again until the early hours of Saturday.

What a treat this “moon party” has been! How many of our friends at home will believe us when we tell them that we saw a moon rise on Sunday evening and set just before noon on the following Wednesday, and that it passed completely through its phases twice as it floated across the sky?

The shades of night have fallen, the stars are just becoming visible in the twilight and we are all ready for a night trip back to the earth, when suddenly a thin crescent moon jumps up from below the western horizon. Our three-day vigil must have gone to our heads, for surely we are “seeing things!” Nature’s machinery seems to have reversed itself! Who ever heard of a moon rising in the west? Upon inquiry the Martians tell us that we are looking at the inner moon—Phobos—which races around Mars faster than the planet turns, so it rises in the west and sets in the east.

Up toward the meridian shoots Phobos, its phase rapidly increasing, and before midnight it has passed through “first quarter” and “full” and has dropped below the eastern horizon. While we are trying to recover from the shock, Phobos flits past the sun on the daylight side of Mars and, having passed through the “new” and “first quarter” phases, again jumps up from below the western horizon about an hour before sunrise, this time a “full” moon. Imagine our consternation when we realize that this moon not only appears to move backward but it rises every 11 hours—three times in a single day—and its phases change so rapidly that the lunar month is over almost before it began. What a moon-system the Martians have! What a story we will have to carry back to the earth! Who will believe us when we talk about a world with one moon rising in the east every five days and another rising in the west every 11 hours?

We might visit each of the other worlds in turn and nowhere would we find time-units that would be of much use to us. Since a year on Jupiter is almost 12 of our years, while its period of rotation is only nine hours and fifty-five minutes, those who live on that planet have about 10,600 days in every year. The fact that nine moons circle about this planet makes it possible for these “people” to select a month to suit their convenience. Which moon do they use? Perhaps all nine of them, who knows?

The rotation period of Saturn is about 10 hours and 15 minutes when measured in our time and this planet requires about 30 of our years to make a trip around the

sun. A simple arithmetical calculation shows that the inhabitants of Saturn have 25,600 days in every year. They also have nine moons from which to select a suitable month. The "people" on Uranus have four moons for determining a lunar month and nature has given them a year of about 68,000 days but, like the year on the other major plants, this time-unit contains so many days that their calendar must be entirely different from ours.

How about the calendars that nature has provided for the inhabitants of the inner planets—Mercury and Venus? Mercury has a year that is less than one-fourth of our year but there is no such thing as a "day" on this little world. Neither is there any succession of day and night. Mercury keeps the same face toward the sun all the time so that one side of the planet is in perpetual sunlight and must be burned to a cinder. The other side is always dark, with a temperature almost absolute zero.

Venus has a year about two-thirds as long as ours but we are not able to make any definite statement with reference to the length of the day on this world. It is only by watching the spots on a planet that we can determine its rotation period and Venus insists upon hiding its surface behind a very dense atmosphere and will not give us even a glimpse of any permanent markings. Some authorities believe that Venus keeps the same face toward the sun just as Mercury does, while others are of the opinion that the earth's twin sister rotates on its axis with a period of about 24 hours, so that its day is about the same as the one nature has given the earth.

Perhaps you are wondering about the calendar used by the inhabitants of the moon. How do they measure time? Since the moon belongs to the earth and is carried around the sun by the earth, their year must be about the same length as ours, but their day is entirely different. For them the sun rises above the eastern horizon and gradually climbs to the meridian, but it does not reach the meridian until a week has elapsed. After another week it sinks slowly below the western horizon and is then invisible for the next two weeks. In other words, the period of time between two successive risings of the sun is exactly the same as what we know as a lunar month. The inhabitants of the moon have two weeks of daylight followed by two weeks of night. They also have another time-unit for measuring periods of short duration. Obviously those living on our side of the moon can watch the earth rotate upon its axis and use this period of rotation as a unit of time, beginning a new unit every time New York City, or some other chosen earthly spot, passes across the center of the earth's disk.

When making this study of calendars which nature has provided for the people who do not live on the earth, we should not overlook the other heavenly bodies similar to the earth but revolving about other suns. Our solar system is merely a "fly speck" in one corner of space. There are many "solar" systems in space besides the one we have just considered and in which we happen to be living. The inhabitants of these worlds belonging to other suns would naturally measure time in years and days just as we do, but their time-units would be of very little value to us.

Some solar systems are composed of planets revolving about two or more suns. Which one of these suns would be used by the inhabitants of one of these worlds for the purpose of measuring time? What would they mean if they should ask the question, "What time is it?" One sun might be just above the horizon and the other near the meridian. Would it be eight o'clock in the morning or would it be noon? Again, let us suppose that we are not on a planet at all, but that we are living in pure space. What time is it? If we should remain indefinitely in pure space we would never arrive at the next year, the next month, or even the next day.

STABILIZING OUR HOLIDAYS

By R. L. DUFFUS

Staff Writer of the New York Times

EVER since civilized man began to work regular hours he has been inventing holidays. The so-called savage does not need them, for he works only to satisfy some immediate need and stops as soon as he has enough to fill his stomach or protect him from the weather. Some of his work, such as hunting, fishing and making tools and weapons, is probably fun. He doesn't draw the sharp line that his civilized brethren do between work and fun.

The more complicated and the more highly organized a human society becomes the more quickly that line is drawn. The distinction is easy to make. Work is something we get paid for. Fun is what we do for nothing. The holiday usually has a religious or patriotic significance, but all the world over it is an excuse for letting off steam, easing tensions, giving tired nerves a rest.

Nobody except a few old-fashioned people who firmly believe that Satan will find mischief still for idle hands to do can possibly object to the multiplication of holidays. Indeed, the increasing use of labor-saving machinery makes it inevitable that there should be a growing amount of leisure for every one. But in such a small world as this is coming to be, a haphazard and irrational arrangement of holidays can create an enormous degree of confusion. A little study of the situation will indicate that a re-arrangement and stabilizing of the world's holidays is almost as essential as an international postal system. When one country's banks and places of business are closed on days when another country's are open, and vice versa, it is difficult for those two countries to do business conveniently together.

Let us suppose that we are in some kind of business which may require us, at one time or another, to buy, sell, borrow or lend in any one of fifty or more countries. We look into the matter of holidays, using, perhaps, the excellent booklet on "Bank and Public Holidays throughout the World" which is issued annually by the Guaranty Trust Company of New York.

We find that, counting Sundays, there are just 57 days in the current year, 1937, that are not holidays somewhere. Of the 57 eighteen are Saturdays, which has long been a half holiday for banks nearly everywhere and which shows signs of becoming a whole holiday for many occupations during all or part of the year. Because holidays falling on Sunday are likely to be observed on the following Monday, and because there is a

tendency to stretch the Christmas and New Year's holidays, especially in the Anglo-Saxon countries, we should probably deduct a dozen more days this year on which we shall not be able to transact business with all our correspondents.

That leaves us with 27 days on which we can reasonably count on finding offices open everywhere—about one day out of every 13 or 14. If every holiday were universal we should work those 27 days and rest the other 338 days.

The chances are that few who read this will have direct business connections all over the world. Yet all of us who live in civilized countries do have such connections *indirectly*. We are all dependent to some extent on foreign trade, for our prosperity is linked up with what our country sells abroad and the satisfaction of our needs is closely connected with what it buys abroad. We undoubtedly pay for the confusion of holidays in lower profits on what we sell and higher prices on what we buy.

There would be less confusion if every holiday had a fixed place in the calendar, or if every holiday fell each year on the same day of the week. But neither of these things is true. A holiday which is tied to a calendar date—December 25, for instance—travels through the week at the rate of a day a year and two days in Leap Years. A holiday which is tied to a day of the week will necessarily fall on a different day of the month. Thus, Christmas falls on Saturday this year but will fall on Sunday in 1938; the Fourth of July fell on Sunday this year but will fall on Monday in 1938; Thanksgiving Day this year is November 25 but next year it will be November 24. Less familiar holidays in this and other countries slip around in the same way.

Now, it is quite clear that we can't abolish other people's holidays and that we cannot permit them to abolish ours. Wars have been fought for lesser causes. Holidays are loaded with sentiment and warm associations. They link past and present in a way that is singularly pleasing to the dizzy dwellers on this whirling earth.

Let us hop around in an imaginary airplane and consider a few of these annual days off. Alaska celebrates Seward's Day on March 30—it was Seward who bought the Territory from Russia. Argentina celebrates its independence on July 9. In Austria May 1st is not a holiday for revolutionary labor or a day to go fishing—it is Constitution Day. In the Azores January 1st is dedicated to Universal Brotherhood. Ethiopia, prior to the Italian conquest, chose September 11 as its New Year's Day; the Chinese New Year falls on February 11; the Jewish New Year is observed on September 6, although the Jewish people also make a holiday of January 1 like the rest of us; in a number of North European countries Mid-Summer Day is celebrated; Palestine, with three major religions, has a plethora of religious holidays; India has so many holidays that a

special functionary has to devote his entire attention to calculating the days on which the movable ones will fall.

In our own country we have quite a number of state and sectional holidays: Admission Day, celebrated in California on September 9; Lee's Birthday and Jefferson Davis' Birthday, observed in several Southern states (Kentucky, by the way, has made both Lee's Birthday and Lincoln's Birthday legal holidays, thus commemorating its historic split during the Civil War); in New Orleans and several other Louisiana communities the Mardi Gras is officially designated; in New Hampshire a Fast Day is usually declared on the fourth Monday of April; Tennessee sets aside a day to honor Nathan Bedford Forrest, the Confederate cavalry leader; Texas commemorates its freedom from Mexico on March 2; Utah honors its pioneers on July 24; Vermont stops work on August 16 to remember the Battle of Bennington, in which a detachment of the British General Burgoyne's troops was defeated.

People who have holidays like these don't want to lose them, but it does seem that something might be done to keep them from prowling up and down the calendar the way they now do. Well, then, somebody suggests, why not organize first a National, then an International Holiday Association? Why not utilize the facilities of the League of Nations, which, though it has not been able to put an end to war, has been very useful in handling a number of international undertakings? The idea is not a bad one, but we will probably have to be a little more fundamental. We will have to decide what we want to do with our holidays.

Mr. Henry Morton Robinson, writing in *The Reader's Digest*, has advanced or revived an ingenious plan. Mr. Robinson points out that at present "when a legal holiday falls on a Sunday it is customary to transfer it to the next day, Monday," and proposes that "when certain holidays fall on any other day than Monday we shall take a full day off the following Monday." In that way every one who got a holiday at all would have a two-day or maybe a three-day vacation. In a similar way business men could adjust themselves to having the mid-week free from interruptions.

World Calendar enthusiasts, I take it, see nothing to criticise in this plan. On the contrary most or all of them have already adopted a similar scheme as a fundamental part of their own plan and are ready to march on in a kind of temporal united front to victory.

It will be at once evident that when there are so many holidays in the world no World Calendar can be so arranged that all holidays will fall on Monday. Yet a goodly number of them do link up with the week-end; December Y or 31 follows Saturday, January 1 falls on Sunday, Leap-Year Day, or June L or 31 follows Saturday, Labor Day may easily be Monday, September 4, and Christmas Day falls on Monday. If other holidays were retained in their present positions in respect to The World Calendar—for

instance, Wednesday, July 4—a business man would at least know where to find them. He would not be confronted with the problems which arise as a major holiday advances, during a series of years, past the week-end—falling on a Thursday, let us say, and thus making Friday a bad business day, or falling on a Tuesday and making Monday a bad business day.

But there could easily be a general agreement, under The World Calendar, that the important holidays in every country—those which really cause a general cessation of work—should be assigned to Monday. Holidays are usually either seasonal or anniversaries. If they are seasonal—for example, if they mark the beginning of any one of the four solstices—they can be shifted a day or two. June 18 or June 25 feels as much like summer as does June 21.

As to anniversaries we must remember that there is and can be no such thing as an exact anniversary. Under our present calendar we celebrate a day which we call December 25, but actually we begin each celebration (between Leap Years) about six hours too soon. This is because it takes the earth not 365 but 365.2422 days to get around the sun. When we throw in a Leap Year we catch up or drop back, whichever way one looks at it but the interval is 366 days. An exact anniversary would have to begin at a certain fixed spot in the earth's orbit regardless of what time the clock said it was. The exactness would hardly compensate for the confusion.

We have to dispense with exactness in holidays, therefore, and fall back on convenience. We can have exactness in our calendar if we wish, and adjust our holidays within it.

In dealing with holidays, of course, we must never forget the emotions and habits which attach to them. Independence Day has intangible values for Americans, Bastille Day for the Frenchman, Boxing Day (the Monday after Christmas) for the Englishman, and a long list of religious holidays for those adhering to the great sects—and for many who are far from devout. How much of the pure joy of spring, there is, for instance, in a lovely Easter Sunday, how much of the pleasure of Christmas comes from the sense of the returning sun!

We don't want to destroy any of the poetry of holidays, nor do we need to. Let the holidays continue to stand for different things to different people in different countries. Let them be religious or patriotic, as they are now—or let them be merely jolly, as one supposes December Y or June L will be under The World Calendar. Let Catholics, Protestants, Jews, Mohammedans, Buddhists, Confucians, Taoists, Americans, Englishmen, Irishmen, Frenchmen, Italians, Germans, read their own meaning and their own traditions into the days they commemorate. The human race must reach back into time and remember. It is good for it to do so, especially in these days of fierce and rapid change. There is a comfort

in feeling the kinship between oneself and one's ancestors.

Moreover, we can afford more holidays rather than fewer. The difficulty in the future, if civilization continues its present rate of technological progress, will not be to find time for holidays but to make good use of them. The use which a man makes of his leisure hours and days may come to be as important as the use he makes of his working periods—even more important. The schools will educate as much for hobbies and avocations as they do for trades and professions. Libraries, theatres, radio and motion picture programs, amateur athletics, parks, playgrounds, laboratories to which the layman may resort, all sorts of commercial recreation, are likely to take on even more significance than now.

The culture of a nation may come to be judged by what it does with its holidays—whether its diversions are on the whole genial, wholesome and one might even say *creative* as well as *recreative*, or whether they take the form which results in a headache the next morning.

We may come to speak of the play-week with just as much seriousness as we do of the work-week and we may do quite as much to adjust it to human needs comfort and convenience. But it will need some thought and experiment to make it come right. The combination of Mr. Robinson's Monday-holiday plan with The World Calendar plan would seem to the present commentator an excellent beginning.

The world is, after all, linked by the intangibles—by sentiment, by customs which can be made to have a universal appeal, by attitudes which are human rather than national or racial. If we were more rational these intangibles might outweigh some of the tangibles which make trouble—the economic rivalries, the pressure of populations on frontiers, the armies and the navies. The present writer is not so naive as to believe that a World Calendar or a world agreement as to the incidence of holidays would end war and bring in the millenium. Yet there is something gained when there is international agreement about anything, no matter how small. And there could be agreement about a calendar and about the placing of at least a few holidays.

The imagination jumps ahead a little. May not the time some day come when there will be holidays that belong to the whole human race and are celebrated with equal zest at the same periods in every land on the face of the earth? These might be linked with the changing seasons but they might commemorate victories and great occasions which are human, not national—some great epoch in the conquest of disease, some great liberating invention, the first steps toward the abolition of war.

Time and holidays are both, in a way, human devices, of interest and concern the world over. They might be made of real service as a means of breaking down the barriers between peoples.

CURRENT PRESS COMMENT

Easter Improvement

New York Times

One seeing the moon as it shone in its glory Tuesday night would be disposed to let it determine the recurrence of Easter: "the first Sunday after the full moon which happens upon or next after the twenty-first day of March; and if the full moon happens upon a Sunday, Easter Day is the Sunday after." Yet it is a complicated calculation into which the lunar month, the solar equinox and the seven-day week all enter, with the result that Easter falls anywhere on or between March 22 and April 25, an uncertainty, as Mr. P. W. Wilson in his "Romance of the Calendar" reckons, of thirty-five days.

Because of this wide fluctuation the British Parliament in 1928 passed a permissive statute with the purpose of bringing Easter within the "orderly scope of a solar measurement of time," determining provisionally that it should be "the first Sunday after the second Saturday in April." This reduces the range of variation from more than a month (thirty-five days) to less than a week. But the change was to await international consent and that has so far not been obtained. The British Isles, emerging from a siege of the worst storms in sixty-seven years and the greatest fall of rain in 122 years (the North snowbound, Scotland cut off, the North of Ireland in a three-day blizzard and the Fens in peril of floods), must be wishing that the statute giving the sun control were in force, for it would doubtless assure Easter more auspicious skies.

As Mr. Wilson observes, "what Easter is to the Christian and Passover to the Jew" cannot be regarded as a "universal" festival, since it affects few of the vast populations of Asia. Yet "cumulatively" when they fall together they become more than doubly significant and impressive, especially in communities such as ours. The romance of the calendar is heightened by its memories of such days and the new hopes with which it inspires the human race.

Reforming Holidays

New York Herald Tribune

"The Reader's Digest" made great headway last year with its campaign against "sudden death" upon the highways; one wonders what it will achieve with its current enthusiasm for the somewhat gentler subject of placing all public holidays on Monday. It is an idea as sensible as daylight saving time and probably twice as hard to bring to fruition. When an accident of the calendar drops the Fourth of July on a Monday or a Friday it is always gratefully acclaimed; but the idea of deliberately postponing the celebration to the Monday when the sacred date itself happens to fall in midweek is sure to come with all the shock of an assault upon the foundations of American tradition.

Yet the long week end is increasingly a part of American life. The automobile and the trailer have combined with the development of distant beaches and mountain parks to give two consecutive rest days a recreational value much higher than that of two days separated by a working interval. The midweek holiday is already an anomaly—so much so that in the case of Thanksgiving there is an ever stronger tendency among those who can afford it to add in the ensuing Friday and Saturday morning. For those who can't afford it, however, it would be a happier and juster arrangement to celebrate the day on Monday.

Calendar reform would help to some extent. The leading project for a perpetual calendar—the equal-quarter "world calendar"—would take care of the Christmas-New Year problem, fixing December 25 permanently on Monday. February 12 would always be Sunday, making Monday observance appropriate; but July 4 and February 22 would both fall eternally on Wednesday, while May 30 and October 12 would be on Thursday. But calendar reform is an even more radical proposal than holiday reform. Perhaps it will divert the campaign for shorter work hours into one for more frequent long holidays.

RECENT CALENDAR RESEARCH

Talk of a New Calendar

By EDWIN C. HILL

Popular Radio Commentator

OUR calendar remains the same as it has been since March, 1582, when Pope Gregory promulgated his reform of the 12-month year which Julius Caesar had instituted 46 years before Christ.

Talk of a new calendar has been going on for the past 30 years. Societies are active here and abroad to bring it about. The latest agency to suggest it is a United States government bureau, the Central Statistical Board. Reporting to the State department, the board says: "The need for establishment of a perpetual calendar is now agreed upon by a large number of business interests, and is sympathetically viewed by agencies of the federal government dealing with statistics."

Advocates of calendar reform are divided on how it should be done. There are groups favoring a year of 13 months, there are others who would retain the 12-month standard but who would equalize the days of the months. These latter groups follow the plan of the Simplified Calendar worked out in 1900 by a Swiss mathematician, Prof. L. A. Grosclaude. This calendar would have the same number of business days in each month; establish a coincidence between the date and the day of the week and bring about a reform of the variable date of Easter.

While this talk of changes in the Gregorian calendar goes on here and in Europe, China is having its own particular problem. Her government, with its modern tendencies, is trying to catch up with the Gregorian calendar and has ordered it substituted for the calendar of the moon, used for centuries by the Chinese. The printing of the old calendars has been forbidden but it goes on in secret. The police of Shanghai and other cities are having their hands full tracking down the bootleggers and confiscating their illegal calendars and almanacs. New Year's may be Jan. 1 to Marshal Kai-shek and his westernized followers, but to most of the Chinese it is a date in February.

Our measure of time has its basis in certain phenomena of the earth and the

heavens. The day is based on the alternating light and darkness of the revolution of the earth. The month is designated by the different phases of the moon and the year by the cycle of the seasons. The 24 hours in a day and the seven days in the week are conventions originated without any regard to astronomical data.

New Deal In Time

By JOHN B. MILLER

Toledo, O.

HOW often do you consult your calendar? To what extent do you rely on it, at home or in the office? If it is a necessity in your life, you should know that it is inaccurate and outmoded. No serious mathematician of our age, no expert in efficiency, would tolerate the present calendar, except for its general usage.

At Geneva, Switzerland, the Council of the League of Nations, in solemn conclave, holds a weighty discussion on the problem of time, its exact basis and measurements. The various systems of time-measurements used throughout the world have caused considerable confusion, and it is said that in the near future some compromise calendar, an improvement on any of the present calendars, will be devised.

It is to be hoped that the Council will find some plan that can be put into intelligent practice all over the world.

The calendar popular in Christian countries today is known as the Gregorian calendar. It was discovered and put into practice in the year 1582 by Pope Gregory.

Pope Gregory's calendar was only slightly different from the Julian calendar, drawn up by Julius Caesar in 46 B. C. Caesar had calculated a year as containing 365 $\frac{1}{4}$ days, but his calculations, when verified by the sun, fell short of three days in each 400 years. By suppressing 10 days in the year 1582 Pope Gregory easily remedied this error of calculation.

The Gregorian calendar has often been in conflict with calendars used in various other parts of the world. Mohammed devised a calendar for Islam, and Omar Khayyam rearranged the Persian year. The old Jewish calendar is still being used.

The World Calendar Association in the

United States and the Rational Calendar Association of Great Britain jointly endorse a new "perpetual" calendar, among whose adherents are Lord Desborough and H. G. Wells.

Their proposed calendar takes the year, not the month, as a basis for accounting and economic figuring. The year is equally divided into quarters of three months each. The first month in each quarter has 31 days, the other two containing only 30 days. Apparently New Year's Eve accepts the brunt of their inability to absorb another day into their even calculation. Having no week-day title, it is simply called New Year's Eve, and the following day, the first day of the new year, is Sunday every year.

This enormously simplifies the allotment of holidays, the keeping of accounts and financial statements. These are the benefits advanced by the proposers of the plan. But, if the system is to be popularly practiced, it must be approved before 1939. That year—1939—begins on a Sunday, which, under our existing calendar, will not occur again until 1950. There is, therefore, need of speedy action.

Origins and Evolutions

BY FRANK E. NOYES

Publisher *Eagle-Star*, Marinette, Wis.

WHEN we speak of a calendar we are talking of time. All nations in all ages from the remotest antiquity have computed time in one way or another. Crude, indeed, were their earliest efforts but there was a similarity in the results because practically all of them figured from the same premises and were guided by the same agencies.

The origin of the alphabet, which is the basis of all written language, goes back many thousands of years, but the calendar goes back many centuries further. Archeologists agree that there were no primitive peoples who did not use some way of measuring time, crude though it may have been. They had their years, their months, their days and their divisions of the day into its lesser portions, until evolved into the exactness of present division into hours, minutes and seconds.

Since the Gregorian calendar went into effect, no country has after once adopting it abandoned it, save only France for a short time during the revolution.

If, then, the Gregorian calendar has been

such a good measure of time for over 350 years, why should it be reformed? What are its shortcomings and what are the advantages of the proposed World Calendar?

This new calendar synchronizes with the months and gives us 182 days in each half year (6 months) and 91 days (3 months) in each quarter year. The present Gregorian months are irregular, varying by one to three days. In The World Calendar they are equalized; and while January, April, July and October have one more day than the other months, this extra day is a Sunday and each month has the same number of secular or business days, namely, 26. Hence business calculations by months can be made with absolute accuracy. Not only is each business month like the others, but each quarter is identical with the others in number of days and in number of weeks. Each quarter begins with a Sunday and ends with a Saturday.

In going from the Gregorian to The World Calendar there is so little change in corresponding dates that only those following the present short month of February and an occasional date following the present 30-day months would need any adjustment.

One great advantage of The World Calendar is the fact that each year and at all times any holiday would always occur on the same day of the week. Under the present calendar it moves forward in the week one or two days each year. For instance, in 1936 Christmas was celebrated on Friday. This year it will come on Saturday and again on Friday in 1942. Because Leap Year intervenes, Christmas will not again appear on Friday until 1953. Under The World Calendar Christmas will always be on Monday and never on any other day, thus providing two holidays at the end of the week. In other words, each year in the new calendar is identical with every other year. If one's birthday is on Saturday, it will be on Saturday for all time to come.

When one becomes familiar with The World Calendar he will know almost instinctively on what day of the week a certain event will recur, and will not be compelled constantly to consult the calendar.

Once in use, the value of this calendar to the business, the professional, the scientific and the religious world will be incalculable.

EXCERPTS AND REVIEWS

Our Unromantic Calendar

By DR. GEORGE R. DODSON

St. Louis Globe-Democrat

WHAT is more unromantic than the calendar, unless it be the dictionary? The concept of time has made the philosophers much trouble, and the measurement of time, though continually improving, is still a part of the "unfinished business" of civilization.

Battles have been fought and riots have resulted when attempts have been made to change the calendar, even though the change was greatly needed. The Gregorian calendar now in general use was not adopted by England until the year 1752. By that time the Julian calendar was ahead not by 10 days, as in 1582, but by 11 days, and England suppressed September 3 to September 18, inclusive. Violent objection was made. Rioters declared that they had been cheated out of wages for 11 days.

Russia was one of the last to make the change to the Gregorian calendar. The Soviet Republic did this promptly. To make the change was one of its first acts. Previous efforts had not been successful. The Julianist conservatives had their way in Greece until 1935, when a synodal court over which the Bishop of Corfu presided, was held to settle the question of new style and old style. In the public square there was an uproar. Protesting people denounced the Archbishop of Athens and were only dispersed when streams of water from fire hoses were showered upon the rioters. The court degraded the conservative bishops to the status of monks and sentenced them to five years' confinement. These are the casualties of reform.

Those who have made no investigation would be surprised to know how many attempts have been made to perfect the calendar. The Babylonians and Persians, the Greeks and Romans, the Mohammedans, the Aztecs, the Hindus, the Chinese, tried to work out satisfactory schemes.

There is now considerable movement in favor of a reform, although the Gregorian calendar has worked well for 300 years.

What is called The World Calendar would be an improvement. The simplifi-

cation would be far-reaching. Churches, courts, Parliament, schools and colleges could make their arrangements ahead for all years to come.

Clocks and Calendars

By ELGIN GROSECLOSE
Oklahoma City, Okla.

POSSIBLY no piece of machinery is so common in all parts of the world as the clock. Probably no piece of literature except the Bible is more frequently consulted than the almanac. These are the instruments by which we measure the time of the day and the time of the year. Yet how little is known of the measurement of time, so essential to the remote farmer as it is essential to the complex civilization of working schedules and time tables!

Early in history the matter of the calendar got mixed up in religion. In Egypt it was very important to know the date of the inundation of the Nile; but it was also important to know the time of the solstices and the equinoxes because the sun was an object of worship. Very early, therefore, possibly as early as 3000 B. C., the Egyptians worked out the solar year on substantially the basis that it is today.

On the other hand, the Babylonians, as well as the early Romans, worshipped the moon and the important time period became the lunar month. Now the problem of reconciling the lunar month with a solar period is one of the most baffling in all astronomical science — apparently it has not yet been satisfactorily solved — and the determination of the feast days became a matter familiar only to the priests.

In Rome, the College of Pontiffs was established to govern the calendar and since there were 150 holy days upon which legal business could not be transacted, which no one knew in advance, the business of the college was very profitable.

When Julius Caesar attempted to reduce its power by adopting the simpler solar year of the Egyptians, he faced a job greater than the conquest of Gaul. The revision of the calendar became a political and religious dispute.

The Jewish sabbath apparently dates from the time of the Babylonian captivity rather than from the Mosaic Code — the

Jews having come under the influence of the lunar calendar of the Babylonians—and when Jesus made His famous statement about the Sabbath He was not opposing the law of Moses but objecting to a Babylonian innovation.

Incidentally, the persistence of some Christians in observing the seventh day would seem to be a confusion of a matter merely of time keeping with a matter of religion. Easter comes under the lunar influence because the Crucifixion occurred at the time of the Passover, which was a movable feast. For a long time the Jewish hierarchy would not reveal how they determined the date of the Passover, and the Christian world had to wait upon the Sanhedrin to tell when Easter would fall. Finally the Council of Nicaea took matters in its own hand and decided it.

Keeping Time

By JOSEPH A. FITZGERALD

Editor, New Haven Teachers' Journal

ONE of the intriguing questions of world-wide interest that came to my attention incidentally at the Portland Convention of the National Education Association was the reform of the calendar. The problem of keeping the march of the seasons in accord with man's record of time has agitated the ancients as well as moderns. About the beginning of the Christian era it became evident that the calendar no longer harmonized with the seasons. In time, crops would be planted in the fall and gathered in the spring. Julius Caesar corrected the inaccuracy and promulgated a calendar that remained unchanged for sixteen centuries. During these centuries the record got out of joint by ten days and to correct this error, Pope Gregory the Great, added ten days to the calendar to bring it into accord. October 5, 1582, became October 15. Since that time the correct conformity of the record and the seasons has been maintained. Why then agitate a question that has been solved?

True, the problem is no longer one of harmony between the record of time and the seasonal changes. It has now become one of removing the inconveniences caused by an arrangement in which months have a varying number of days, important feasts and holidays move about, and the

days of the month fall on different week days each year. Every one of these variations causes many difficulties in our daily lives and plans.

Those employed on a monthly basis are paid the same amount in months having twenty-eight, twenty-nine, thirty, or thirty-one days. Statistics of business are difficult to compare, for the quarters of the year may have ninety, ninety-one, or ninety-two days. The first half of the year has one hundred eighty-one or one hundred eighty-two days, and the last half one hundred eighty-four days. Labor Day which marks the beginning of school and the end of a hotel season, may vary in date from September first to September seventh. School and college calendars are inconvenienced by this variation as well as by the instability of the Easter date which, in turn, determines the lives and business fortunes of countless thousands in the textile and hat industries. Department and clothing stores, florists, and communication services are all affected by an early or late Easter, for if the holiday is early, trade is light.

Our own school calendar is a very practical case in point. A great deal of the difficulty in arranging the calendar for the New Haven Schools arises from the instability of Labor Day. If the calendar were stable, Labor Day and Easter would likewise be fixed and the problem of squeezing 190 school days, with suitable vacation periods between Labor Day and the end of June, once adjusted, would no longer require yearly adjustment. Our 190-day school year could be arranged to begin on September 5 and end on June 25, allowing the customary Christmas recess and one week of vacation out of every eight thereafter. Holidays like Columbus Day, Thanksgiving, Washington's Birthday, and Memorial Day would all be celebrated on their appropriate dates.

World-wide interest has been aroused by the suggestion that a perpetual calendar be adopted. An international congress under the auspices of the League of Nations will consider the matter next year with a view to adopting a 12-month perpetual calendar for the year 1939. This movement has engaged the attention of 44 countries. Numerous business, scientific, and religious organizations have gone on record in favor of the change.

EDITORIAL PARAGRAPHS

It would surprise no one in Washington should President Roosevelt use his great power to help "set" the clock that divides our months and years so that our calendar will agree with the Sun—a Divine time-piece that does not change through the ages.—*Shippensburg (Pa.) News-Chronicle*.

The World Calendar Association has been carrying on an agitation for many years for reforming the calendar in the distribution of days in the months. They have secured the support of prominent men in many countries and their plan has been given serious discussion at the headquarters of the League of Nations in Geneva.—*Great Falls (Mont.) Tribune*.

At last week's conference of the British Federation of Hotel and Apartment Associations, held at Southport, a resolution asking for a fixed Easter to enable schools to begin their holidays on the Friday nearest April 7th was passed, and a resolution that an attempt be made to obtain an extra Bank Holiday on the first Monday in July, to commemorate the Coronation, was approved.—*London World's Fair*.

The 12-month plan, as has been emphasized again and again, removes the objectionable irregularities of the present calendar without setting up a dead level of uniformity of months and an irregularity of the year immeasurably worse than any that now exists. Such a calendar would be perpetual, and except for leap year would require no change from year to year. Any given date would always fall on the same day of the week. For commercial, financial, and all statistical purposes, all quarter years would be exactly alike, and every month would contain exactly 26 week-days. — *Belvidere (Ill.) Republican*.

Efforts are continuing by sponsors of The World Calendar to bring about a change in the calendar. Leaders in world affairs have approved the idea and it is hoped by some of the advocates to have the change effective by Sunday, January 1, 1939.—*Quincy (Mass.) Patriot Ledger*.

United States participation in any international effort to reform the calendar has been recommended by the Central Statistical Board, a federal agency for co-ordinating statistics.—*Duluth (Minn.) Herald*.

Calendar reform bobs up again. The demand is said to come chiefly from scientific societies and business organizations seeking to simplify statistical comparisons and business reports.—*Burlington (Iowa) Hawk Eye*.

The Vatican now only opposes the idea very mildly, not from any doctrinal reason but because it is a change of a long-established custom. A large number of Roman Catholics individually, and some Roman Catholic nations collectively, want it. The Abbot of Farnborough is the champion of the proposal, and has had interviews on the subject with the Pope. Lord Desborough says that the Lancashire operatives are strongly in favor of the change, and he has resolutions representing 800,000 of them.—*Manchester (England) Guardian*.

The British Government formally announced its advocacy of calendar reform on March 4, 1936. The announcement, made from the floor of the House of Lords, stated that the British delegates at Geneva would give "most sympathetic consideration" to the question. — *Toronto Mail-Empire*.

Calendar reform on the perpetual 12-month equal-quarter basis has won or is gaining support and approval among the leaders of Governments of France, Germany, Holland and Belgium, Scandinavia, Greece, Turkey, Switzerland and elsewhere throughout the World.—*Plymouth (Ind.) Daily News*.

The plan for a modified 12-months World Calendar apparently grows by leaps and bounds in public approval and without aid of selfish political or private promoter, the idea bids fair to capture the world. All the way from Mandalay to Geneva there's talk about calendar reform.—*Miami Beach (Fla.) Times*.

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EDITORS

CHARLES D. MORRIS

CHARLES C. SUTTER

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NEW YORK CITY is planning the greatest World's Fair in history, to open early in 1939. Participation by leading governments is already assured, and it has been suggested that adoption of The World Calendar might well be made a central idea for all official participants, including the League of Nations.

Such recognition of the calendar and its importance in human history is undoubtedly a worthy idea. The part which the calendar has played in mankind's culture, education and achievement is a subject which has begun to receive attention in recent writings. Schools and parliaments may be expected to give increasing emphasis to it during the approaching official discussions of the League's proposals for revision.

"The calendar is the framework of any civilization," writes Prof. S. Langdon of Oxford. "It is the time index for all business transactions and religious observances, the rule by which all daily life is regulated."

And P. W. Wilson in his recent book *The Romance of the Calendar*, adds: "Can it be said that during the millennia of man's recorded activities, however many of these millennia there may be, anything has been elaborated that, in its field of uninterrupted continuity, is comparable with the calendar? In a discordant world the calendar is a miracle of unanimity. For thousands of years it has been associated both with the spiritual and the secular activities of the race."

That the history and significance of the calendar should be known in every home and school, is an entirely suitable idea for the year 1939, set by the League of Nations for adoption of the new calendar. And there is an intriguing task for those who may be assigned by the League of Nations to prepare for exhibition at the New York World's Fair a complete visual presentation of calendar lore. Such a presentation might well prove one of the most interesting and unique displays in the whole exhibition.

FROM THE MAIL BAG

You are to be congratulated, as we all are, upon the progress of the plan undertaken by The World Calendar Association for the revision of the calendar. Apparently the official way is being opened for the acceptance on every hand of the new calendar.—Rt. Rev. James DeWolf Perry, Presiding Bishop of the Protestant Episcopal Church.

Greatly interested in your movement for calendar reform and shall be glad to present it to the Federation at the meeting in Chicago for their consideration.—Dr. W. L. Bierring, Fed. State Medical Boards, Des Moines.

The World Calendar is much better than any other proposal that I have examined. There is no reason why it should not be put into operation at an early date. It would be a great help to school and college administrators.—J. C. Hardy, President Mary Hardin-Baylor College, Belton, Tex.

I am indeed interested in the recent strong leadership taken by the Archbishop of Canterbury for calendar reform.—Rt. Rev. Philip Cook, President National Council, Protestant Episcopal Church.

Adoption of The World Calendar would be extremely helpful in arranging annual school calendars. It seems to be the very best of the proposals which have been made.—Mother G. C. Dammann, President Manhattanville College, New York.

I shall be delighted to bring the matter before my Executive Committee.—Miss Pinkston, Exec. Sec. Dept. Elementary School Principals, N. E. A., Washington.

It is particularly encouraging to know that opinion seems to be in favor of the 12-month plan.—D. L. Gill, Sec'y American Chamber of Commerce in London.

The Government of the Principality of Liechtenstein is interested in information about the carrying out of plans for The World Calendar.—Dr. Joseph Hoop, Administrator of Liechtenstein.

I can see no rational objections to the suggested change. I, myself, favor it.—W. S. A. Pott, Pres. Elmira College, Elmira, N. Y.

It ought to be a matter for the Lambeth Conference to decide.—Rt. Rev. H. J. Mikell, Bishop of Atlanta.

Reform of the calendar is of the greatest importance. — Count Henri Begouen, archaeologist and anthropologist, Saint-Girons, France.

Fixing of Easter on a permanent date is one of the most important desiderata of this movement.—Frederick D. Leete, Bishop Methodist Episcopal Church, Omaha.

I am quite sure that reform of the calendar is long overdue.—George J. Trueman, Pres. Mount Allison Univ., Sackville, New Brunswick.

Those of us who are in educational work in a foreign country are naturally sympathetic with the idea of a more stable calendar. In Asia Minor we have many feasts which change in accordance with Moslem and Oriental calendars, so we appreciate the need for regularity even more than persons who live in America. It would be a great help if people in general could adopt the sort of calendar you have suggested. It would simplify educational work if regularity could be accomplished.—Bayard Dodge, Pres. American University, Beirut, Syria.

I am heartily in favor of a settled date for Easter and believe that the entire reform would be a good thing.—Bishop E. G. Richardson, Phila.

At first I had only a mild curiosity. However, after applying the reform to my own situation I began to appreciate its great advantages not only to myself but to all people in my profession as well.—F. C. Brown, Dist. Supt. State Dept. of Education, Westfield, N. Y.

I have been a member of The World Calendar Association for some time and have read the Journal. I take this opportunity of expressing to you the very great pleasure I derived from reading the current issue, which contains the most interesting series of articles that have yet come to my attention. The Journal is of great aid in furthering a much-to-be-hoped-for reform.—Maurice F. Lipton, Equitable Life Assurance Society, New York.

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“ROMANCE OF THE CALENDAR”

Press comments on the book written by P. W. Wilson and published at \$3 by W. W. Norton & Co. of New York, and Allen & Unwin of London.

Here is a book which unfolds the fascinating story of a household and office accessory which we have all been taking far too lightly.—*Toronto Saturday Night*.

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A grand book to pick up at moments, and fully as good as a detective story.—C. P. Rollins in *Saturday Review of Literature*.

The book is to be welcomed as rendering easily available information which heretofore had to be sought in hidden places.—D. D. Zuver in *The Churchman*.

Most of the many curious ways man has used to measure the flow of time are summarized in this attractive book.—Karl Gotha in *Brooklyn Times Union*.

Time stumbles on! An excellent subject and the author has gathered a fistful of interesting data.—*Kansas City Star*.

This book is really as interesting as it is instructive. . . . The proposed simplification of the calendar would be an improvement, for the calendar is still part of the “unfinished business” of civilization.—George Dodson in *St. Louis Globe-Democrat*.

Adoption of The World Calendar would considerably simplify life everywhere. . . . Here in a single volume which may be read comfortably and agreeably in a couple of evenings is the whole absorbing story of the measurement of time, from man's earliest experiments to the present movement for reform. Mr. Wilson does not devote himself to any propaganda, but he presents the facts, ancient and modern, in a conspicuously well-ordered and readable manner. A book as intelligently done as this, on a subject that touches us all intimately, can hardly fail to interest any reader.—Herschel Brickell in *Review of Reviews*.

The subject of this book is significant and its intention sensible. . . . Advantages of The World Calendar plan are obvious—preserving the Gregorian framework, it eliminates minor inconsistencies.—*San Francisco Chronicle*.

Mr. Wilson turns up spadefuls of hope for a more accurate calendar. The calendar is a nut which has been a-cracking these many centuries. Science has nurtured it from obscure beginnings, but the church has done more to foster it than anyone else. . . . The calendar as it is leaves much to be desired. The philosopher Comte thought he had nailed it with his 13-month idea, but it never caught on. . . . Mr. Wilson leads his reader through the maze of calendar history and braces us for the shock of having the world tick to the slightly altered measure of the reformed World Calendar.—*Portland Oregonian*.

Popular account of a difficult subject.—*Springfield Republican*.

It is astonishing how much interesting material has been collected in this volume.—*Columbia (S. C.) State*.

This survey of the development and significance of the calendar is informative and makes very interesting reading.—*Providence News-Tribune*.

No piece of machinery is more common in all parts of the world than the clock. No piece of literature is more frequently consulted than the almanac. Yet how little is known of the measurement of time, as essential to the peasant farmer as to the complex of industry and science.—*Elgin Groseclose in Oklahoma City Oklahoman*.

Curious and amazing facts make Mr. Wilson's story of the calendar absorbing reading, every page possessing that believe-it-or-not quality that impels you to read on and on.—*Cincinnati Times-Star*.

Mr. Wilson discloses interestingly the origins of the calendar from times of remotest antiquity and concludes with a consideration of the calendar reform movement.—*Watkins Glen (N. Y.) Express*.



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THE WORLD CALENDAR

All Years Alike
All Quarters Equal

First Quarter

JANUARY

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
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Second Quarter

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Third Quarter

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Fourth Quarter

OCTOBER

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*

*YEAR-END DAY, December Y, follows December 30th every year

**LEAP-YEAR DAY, June L, follows June 30th in leap years

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a "perpetual" calendar. Every year is the same; every quarter identical.

In this new calendar, each quarter contains exactly three months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Every month has 26 weekdays.

In order to make the calendar perpetual, at the same time retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30th and January 1st and considered an extra Saturday. The 366th day in leap years, called Leap-Year Day, is intercalated between June

30th and July 1st on another extra Saturday. These intercalary or stabilizing days are tabulated as December 31 or Y and June 31 or L, and would probably be observed as international holidays. January 1st, New Year's Day, always falls on Sunday.

The revised calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, coordinates the different time-periods, and stabilizes religious and secular holidays when approved by their respective authorities. As compared with any other proposal for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made with a minimum of disturbance.

"Our stability is but balance."—Robert Bridges.

JOURNAL OF CALENDAR REFORM

EDITORS

CHARLES D. MORRIS CHARLES C. SUTTER

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ELISABETH ACHELIS, *President*



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HISTORIAN LOOKS AT TIME

By JAMES TRUSLOW ADAMS

CALENDAR difficulties for the historian arise from three sources: the variety of calendars, the differences in dates of changing the Christian calendar, and, in common with men in other occupations, the faults of that calendar even as we have it today. The past is past and we cannot alter that, but if we can get a better calendar for the future we should, in my opinion, most certainly do so. As historians it will take us some time to benefit by it, but future historians will benefit greatly, and we historians and men of all other callings would benefit, as ordinary citizens, immediately.

The World Calendar appears to me an enormous improvement over our present one. To mention only a few points: it offers great advantages in that every quarter is of the same length; it is perpetual and identical for every year; every date of each month falls on the same day of the week every year; and so on.

These are marked improvements. Variation plays an important part in life, biologically and psychologically. I am opposed to standardization in many fields, but there are other fields in which a complete standardization vastly simplifies life and saves waste of time and effort. In London, for example, where I lived for many years, the voltage of the electric current varies throughout the city. On one occasion I moved from one house to another within a few blocks, and found that I had to buy an entirely new set of light bulbs and have all the electric implements—iron,

toaster, etc.—altered. In America we can use the same from the Atlantic to the Pacific. That is sensible standardization. In any occupation, we live in a network of time, and if anything should be standardized and simplified it should be the measurement of time.

The proposed calendar does this. Moreover, it does it with a minimum of dislocation of the old calendar and of our accustomed habits of thought. As Mark Twain said: "There is a lot of human nature in man," and it is one of our human traits not to like change. Change bothers us. There are 24 hours in the day but we Americans and English have got used to counting them in two lots of 12 each and calling them A.M. and P.M. The time tables on the continent in Europe run through the whole 24, but I doubt if any American who reads that his train starts at 14 o'clock and arrives at 23 o'clock does so without a mental arithmetic problem of what that means on his watch, which has only 12 hours.

In calendar reform, two things are thus of importance. One is that it should dislocate our ways of thinking as little as possible; and the other is that it should be as universal as possible, that is, standardized. The World Calendar as proposed, in keeping to the 12-month year and rejecting the earlier plan of 13 months, accomplishes the first object and makes the shift extremely simple. The other object can be attained only by the general sanction of most nations. If only one or two agreed, I should be opposed to it for it would merely increase the present confusion.

We have, however, it seems to me, an unusual opportunity to make the improvement with a chance of such unanimity as we may not have again. I take it for granted that my readers are familiar with the form of the new World Calendar. If so they realize that it must be put into operation on January 1, 1939, or else wait until the next possible date, January 1, 1950. At present we have the League of Nations functioning, and the easiest method of obtaining general sanction for the change is through that body, which may or may not continue to function indefinitely in the future. So many nations, including most of the important ones, have already signified their interest in the change and their willingness to join in making it, that a great step forward has been taken, and in the uncertainties of the future it cannot be foretold when such agreement might again be possible. The change would be comparatively easy now as contrasted with 1752.

In fact the ease with which the calendar could be changed now as compared with then is an interesting commentary on the increase in diffused intelligence. At that time, mobs demanded in the London streets that they "be given back their eleven days."

Various things have helped in changing the attitude of the general public to time. For one thing, the use of "summer time" has made their minds more flexible with regard to making time suit man rather than man

suit time. For another thing, the radio has made people understand better the relativity of time. The millions in America who got up at five a.m. to listen in to the Coronation ceremonies going on in England at ten a.m. had a simple lesson in time, but one likely not to be lost on them. The enormous increase of travel east and west, with the frequent changes in the clock, has had the same effect.

Just as we have got over the belief that six o'clock is six o'clock and that is all there is to it, our minds have, as I said, become flexible with regard to time. We use time as something to be measured in the most convenient way, and I believe the same would be true of the calendar which measures the larger units of time. The changes involved in habits of thought from the use of the new World Calendar would be so slight, after the first few adjustments, that I believe they would involve no difficulties and would pass as unnoticed as the shifts to summer time and back again. The advantages, not only for the historian but for all of us in all our lives, would be immense.

The decisions will have to be taken by governments, acting in concert, rather than by popular votes. The opportunity for acting in concert is now presented by the machinery set up by the League of Nations, whether any particular nation is a member or not. The problem is to get national governments to take action, with the understanding that action will not be taken unless it is fairly general.

I would suggest that representative bodies of all phases of life in each nation should, so far as possible, be induced to make their approval of The World Calendar known. I cannot imagine any historical society disapproving of the change. Quite obviously, I have no right to speak for the American Historical Society of which I am merely a member, but certainly as an individual historian, as well as an ex-many-other-things, I approve heartily of the suggested change and hope that it may be carried into effect.

Although I was asked to write this article from the standpoint of an historian, I may say that I have been a good many things else in my life, such as stockbroker, banker, railroad officer, manufacturer and army officer. In all of these capacities I was incessantly bound to a calendar and having to figure time in shorter or longer periods. The Stock Exchange, for example, opens at ten. Loans have to be called, or used to, by ten-thirty. Deliveries have to be made by 2.15 or can be refused. The Exchange and banks close at three, by which time all over-drafts have to be made good. Securities sold one day are deliverable the next, except those on Friday which are deliverable Monday. There are also special "delayed deliveries" ranging from three days to perhaps several weeks. Wages are paid weekly and salaries monthly. Interest is figured daily and customers' accounts presented monthly. Stock dividends have, mostly, to be kept track

of quarterly, and bond interest semi-annually. So it goes. The electric clock and the yearly calendar are consulted hundreds of times a day.

It is equally true, or even more so, of the other occupations I have engaged in. In railroading it is not merely a question of whether the trains do or do not run "on time." The whole business is bound up with time in one form or another. There are the complicated time-tables, figured not only in hours and minutes but always with having to consider Sundays and holidays and changes of traffic with the seasons. Again there are the daily wages and the monthly salaries. There are the daily, weekly, monthly and quarterly reports of all sorts to make up, such as car loadings, passengers carried, and so on and on.

I need not stress the point with regard to the other occupations, and I have mentioned them merely to show that my lifelong dependence and constant reliance upon a calendar has been based on experiences and needs other than those of an historian only. During my years of varied work it has been borne in on me that although the calendar is an indispensable tool, it is, as now constituted, an unnecessarily clumsy one.

For example, to go back to railroading. We wish to compare the operating results of one month with those of another. Of the two consecutive months, February and March, one has more than 10 per cent more days than the other, throwing out the comparison of all statistics by that amount. Or we are comparing July of one year with that of another. In one year there may have been five Sundays and in the other only four, with corresponding allowances to be made for lessened freight movement and increased passenger traffic. Again in one year the Fourth may have come on a Wednesday with five Sundays in the month. In another year it may have fallen on a Saturday, and there may have been only four Sundays. In the first case there would be six week-ends and holidays for passenger traffic and in the other only four, a difference of fifty per cent.

For an historian the calendar is a constant nuisance and perplexity. The troubles are numerous. Different countries and races have different calendars. In western Europe there are mainly three, the Jewish, Mohammedian and Christian. The last is the one most of us have to deal with, but even in that there are variations. To mention only some, we may note that between the time of Augustus and that of Pope Gregory the calendar had got about ten days behind. The various countries which finally accepted his reform, with the suggestion that ten days be dropped, did so at different periods during a number of centuries. Some waited so long that eleven instead of ten days had eventually to be dropped. Great Britain, including the then American colonies, did not make the change until 1752. Russia continued without change until the present century and other nations made it at different periods.

Let us say that as an historian I am trying to study an event or a

series of them as written in different languages by the historians or analists of a half-dozen countries in, say, 1700. The sequence of dates, such as those at the outbreak of a war, may be of the utmost importance, but in order to make sure of them I would have to go through laborious research to determine what calendar each of the historians of different nationalities was using at the time of writing. Even if all gave the correct dates by his own mode of reckoning I would have to translate these into one common denominator, so to speak, and then allow again for our own change in 1752.

But even so, we are not finished. In scholarly works the dates before 1752 are usually given both Old and New Style. Thus, in the *Dictionary of American Biography*, the date of Washington's birthday is entered as February 11/22. He himself celebrated his anniversaries on the 11th. We celebrate it on the 22d. But to write a whole volume of history or biography giving always the double date is annoying to the reader. If the writer of a book, or any person dealing in one way or another with the period prior to 1752, is a scholar he will probably say at the beginning that all dates are Old or New Style. But there are many books and manuscripts not only of the earlier years after the change but even of today, in which we are left in doubt as to which style is used. If the event is an important one we are likely to know or can check it up, but if it is an obscure one, but which nevertheless may be essential for our purpose, it may entail long research, and even so be finally left undetermined.

To mention only one other point, there are the occasional "freak" calendars used, such as that of the French Revolution. What bewilderment and waste of time have been caused not only to students of that period but even to ordinary readers of books dealing with it by authors who seem to think it scholarly to talk of the "VIIIth of Brumaire" and so on instead of the dates in the ordinary calendar.

ORGANIZATIONAL ACTIVITY IN AUSTRIA

INTEREST in calendar reform in Austria resulted during the past few months in an official inquiry from the Foreign Office, inviting all the important economic and trade organizations in the country to state their position in regard to the League of Nations' proposals for international adoption of The World Calendar.

The most important of the groups which sent in prompt and comprehensive reports to the government was the influential "Industrial Association of Austria," which urged Austrian support of The World Calendar. A few days later similar recommendations were received from the Book Dealers Association, reporting "an overwhelming majority of their members" for calendar revision, and also from the Merchants Association, the Austrian Board of Trade, the National Cooperative Organization of Small Trades, and the Association of the Restaurant and Hotel Trades, which expressed a desire to have the new calendar inaugurated if possible with the beginning of the year 1939.

Official studies were also made by the Ministry of the Interior and the Ministerial Cabinet.

TIME'S UNRULY CHILDREN

Address Before the International Women's Week, Budapest, August 9, 1937

By ELISABETH ACHELIS

President of The World Calendar Association

HOW many of us assembled here today in beautiful Budapest realize that the same unsatisfactory and deplorable conditions existing in our world today—confusion, disorder, inequalities and lack of co-operation—prevail in a very notable degree in our calendar? To remove these undesirable conditions and to institute in their stead the desirable qualities of stability, order, equality and cooperation are the objectives of calendar reform.

In the short time available to me I can only outline to you the fascinating history of the calendar. There have been four great reforms in the past. The first reform was that of the Egyptians when they rejected the moon and accepted the sun as the prime recorder of time. For the sun directly affects the seasons upon which the year is based. The second occurred under Julius Caesar when the leap-year rule was introduced into the calendar, a necessary measure by which the year is brought into rhythmic step with the seasons. The third was that of Constantine the Great when he introduced the 7-day week into the civil calendar, the week having been unknown to the ancient Egyptians and Romans. The last change was the well-known Gregorian reform of 1582. It amended the leap-year rule, and adjusted the seasons to their proper places in the calendar by a drastic alteration of dates. Thus we see that the calendar we use is not a static thing, as is sometimes assumed, but is man-made. It is man's attempt to adjust his yearly time-piece in tune with nature. The reform of today is but another progressive step toward further needed improvements.

How to harmonize the different time-units, the day, the week, the month and seasons *within* the year, has ever been man's great problem. It is a problem that has remained unsolved throughout the past, and because it has remained unsolved, our calendar is *not* a happy family of time. The various offspring—the 24-hour day (of which there are 365 in ordinary and 366 in leap years), the 7-day week of which there are 52, the irregular length of the twelve months, the four seasons, the unequal quarter and half-year divisions—never agree among themselves, neither do they co-operate with each other. Father Time's family contains a most unruly lot of children. And the result is inevitable confusion and discord.

The yearly difficulties and disagreements among them are many. The year never begins on the same week-day twice in succession. Month dates

and days of the week never correspond—thus August 1st last year was on a Saturday and this year on a Sunday. The months do not necessarily have the same number of Sundays, Mondays, or Fridays. . . . Annual educational and vacational schedules are never the same. Accurate comparisons between one year and the next are never possible.

We may well query why this unsatisfactory and changeable calendar has been tolerated so long. It has been tolerated on the ground of familiarity. We have become accustomed to it and as such have taken it for granted. But in these days people are no longer content to respect institutions merely because they *are* institutions and are prepared to examine existing conditions and, when it seems best, to improve upon them. The characteristics exhibited in our present calendar contain everything we deplore—irregularities, inequalities and disorder. Is it to be wondered at that other systems and activities of man are equally confused and equally devoid of harmony and happiness? Especially is this true when we realize that time plays an important part in every phase of man's life and in all of his many activities.

To establish a happy family of time, wherein all the different offspring are free to perform their work in harmonious and brotherly relationship, is the aim of reform. We are no longer satisfied with a lot of unruly children. We desire and insist upon fraternal relationships.

But how is this to be attained? How is the mathematical problem, which contains so many differences, to be solved? The genius of calendar reform was a Roman Catholic priest, Abbe Mastrofini, who found the key to the problem. It was this priest who arranged the year into 364 days, a number easily divisible, and conceived the one or two "intercalary" days required to keep the calendar in proper step with the seasons. The intercalary 365th day he placed at the closing of the year, now known as the Year-End Day (an extra Saturday), and the 366th day in leap years, known as Leap-Year Day (another extra Saturday), he intercalated between the first and the second halves of the year. By this method every year begins with Sunday, January 1st and the second half of the year always begins with Sunday, July 1st. Thus has religion in one of its inspired moments solved the difficulty. By this masterly stroke the calendar found its stability. The family of time has found its permanent and peaceful home.

By keeping to the 12 months and dividing the calendar into half years of 182 days or six months, and quarter years of 91 days or three months, and by giving the first month in every quarter 31 days and the remaining two months 30 days each, we obtain the following advantages:—

Every quarter year begins with Sunday and ends with Saturday. Thus the 91 days, the 13 weeks and the 3 months come together in perfect agreement, four times a year. Then comes the intercalary Year-End Day to

complete the year—a day of pause and reflection, a day of universal fellowship. The children of time have found their harmony and balance; cooperation now exists among them. This new calendar, known as The World Calendar, secures stability, unity, equality and order—characteristics that *invite* our enthusiasm and support.

In all frankness I must mention that another plan, the 13-month calendar, had at one time received serious consideration, but the awkwardness and unpopularity of the number 13, together with the drastic changes that its adoption would bring, has steadily driven this plan into the background. The 12-month reform holds the field.

But how is the reform to be accomplished and by what means can the new calendar be put into active operation?

A calendar does not belong to one special group, nation or people. It must be universal in outlook and scope. It must be used for the greater good of mankind without partiality or bias. Thus the reform exercises a world-wide influence in the direction of international cooperation and world fellowship in the use of one and the same calendar.

It is fortunate that there exists an international organization which has had the subject under deliberation for some time. The League of Nations has carefully studied the question and within this year has been active in placing The World Calendar before the various governments for their opinion.

During this coming September two meetings will be held in Geneva when it is hoped that the result of these meetings will be the calling of an international conference in the early months of next year. At this conference it is anticipated that an agreement will be reached among the more or less influential nations to put the new calendar into operation by January 1st, 1939. This early date may surprise you. The date is highly important, however, because January 1st in that year will fall on a Sunday in both the old and the new calendars, thereby making the transition an easy one. This juxtaposition does not occur again until 1950.

Prominent organizations in many countries have been studying the question and have approved it, notably the whole body of Chambers of Commerce of the British Empire. In America prominent scientific associations have endorsed it and quite recently the important National Education Association. The General Federation of Women's Clubs has a committee studying the reform. Many important international organizations have also repeatedly expressed their approval of calendar reform, among them the International Labour Organization at Geneva.

In religious fields the great Universal Christian Council for Life and Work, which has just concluded its remarkable conference at Oxford, England, at its meeting last year at Chamby, Switzerland, passed a reso-

lution strongly endorsing the plan; the Eastern Orthodox Church in an official report in 1931 approved it. The Vatican has repeatedly stated that there is no objection to the reform on the ground of dogma. In fact, many of the most loyal and valuable advocates of reform are Roman Catholic statesmen and priests. And in the Orient it is well known that China and Japan are favorable to the 12-month revision.

I feel it is a great privilege and honor to speak to you today on this lively subject, because I am a firm believer that woman's opinion exerts a powerful influence on all national and international affairs, and when once enlisted it can achieve wonders. For the *combined* forces of men and women will provide the zeal and impetus that are needed now to ensure speedy and effective action.

It has truly been said that the reform of the calendar will crown with honor that generation which has the vision and courage to achieve it. *Let ours be that generation.*

In the coming months there will be many opportunities for making known to the governments of the nations that there exists a real desire and an enlightened opinion in favor of the reform. May I express my fervent hope that what I have said will encourage you to use your active influence to induce your respective organizations and governments to support this worthy cause.

The success of the League of Nations in this matter will prove definitely that international conferences are successful, that world cooperation is practical, and that not only has the family of time secured a fraternal fellowship among its various time-children but that a foundation stone has been laid upon which it may be possible to build other systems of similar aims.

OBITUARY NOTES

PROFESSOR H. PARKER WILLIS, of Columbia University, had been a member of the American Advisory Committee of The World Calendar Association for several years. He died at his summer home in Martha's Vineyard, Mass., on July 18. He had written extensively on calendar reform, particularly in its relationship to banking and finance, on which he was perhaps the greatest of American authorities.

MEREDITH N. STILES, a former secretary of the International Fixed Calendar League and author of a book on "The World's Work and the Calendar," died in Rochester, N. Y., on June 26, aged 57. He had been active in calendar reform for the 13-month plan and had attended many international conferences on the subject.

ROBERT HUNT LYMAN, for fifteen years editor of The World Almanac, died in New York on September 3, aged 73. He was a Yale graduate who had been active in journalism for nearly fifty years. His writings on calendar reform included an article on "When Old Style Became New," published in the *Journal of Calendar Reform* in June, 1934.

A MEMOIR OF ABBOT CABROL

By J. B. PERRY ROBINSON

Secretary of the Rational Calendar Association, London

THE DEATH on June 4th of the Right Reverend Dom Fernand Cabrol, Abbot of Farnborough, removes one of the greatest scholars of the Roman Catholic Church and one of the best friends of Calendar Reform. Foremost in England among the authorities of the Church on the history and forms of the liturgy, Abbot Cabrol made the cause of Calendar Reform his own and rendered inestimable services in bringing its virtues to the knowledge of the Hierarchy and people of the Roman Church. His words carried great weight, and his approval of the movement was a potent factor in securing the sympathetic support of Roman Catholics in his own and other countries. He was a man held in high honor as a scholar, as an interpreter of the mysteries of the liturgy, and as an administrator. He was also a man deeply loved, not only in his own Abbey, but by a multitude of friends in all parts of the world.

He died in England at the age of 82, after what was probably the first illness of his life. He was born at Marseilles in 1855 and professed a Benedictine monk at Solesmes in 1877. He entered the priesthood in 1882 and was Prior of Solesmes from 1890 to 1896.

When in the latter year the Empress Eugénie founded a Benedictine monastery for monks of Solesmes at Farnborough, in Hampshire in the South of England, Dom Cabrol was appointed its first Prior, becoming Abbot in 1903. Throughout the Empress's long residence at Farnborough Hill he was her private chaplain, and he remained her confidential friend until the memorable day in July, 1920, when in the presence of three kings and a great company of princes, prelates and nobles he pronounced the funeral oration over her remains. Her body was laid in the Imperial Mausoleum at Farnborough, in the care of the Abbey.

The record of Dom Cabrol's scholarship begins in his early days at Solesmes with the first of several biographical studies of great churchmen. Throughout his life he continued his historical research and issued a series of treatises, studies and books, mainly on liturgical subjects. The two achievements by which he will be most remembered are his editing of the Roman Missal in such a way as to make it intelligible to the people as well as to the priesthood, and his work as founder and co-editor (with Dom Henri Leclerc) of the great *Dictionnaire d'Archéologie Chrétienne et de Liturgie*. This monumental production occupied much of his time for the last 20 years, and he is reputed to have written over a million words in contributions to the 140-odd parts of it that appeared before his death.

He was a frequent contributor also to Catholic reviews and periodicals, and many of his publications—generally written in French—have been translated into other languages in all parts of the world. One of the subjects on which he had written most was that of the ecclesiastical aspects of general Calendar Reform. When, a few years ago, the proposals of The World Calendar were brought to his notice, he accepted them instantly.

At all important church congresses in France and England he was a familiar figure. He was a vice-president of the Lingard Society and of the Catholic Council for International Relations. He was made a Fellow of the Society of Antiquaries in 1924, and from the French Government he received the decoration of *Officier de l'Academie* in 1932 and of *Chevalier de la Légion d'Honneur* in 1935. After the Great War, the British Government conferred on him the Order of the British Empire.

One of his last journeys from England was a visit to Rome in June, 1935, at the age of 80, as leader of the Mission of Enquiry organized by the Rational Calendar Association to ascertain the attitude of the Vatican on Calendar Reform.

I had the great pleasure of accompanying Abbot Cabrol on this mission to Rome. There could have been no more charming companion for such an expedition. With all the dignity of his years and his scholarship, he had a natural gaiety of temper and a gentle humorous disposition that made intercourse with him delightfully easy for one much less than half his years. Moreover, to be in Rome with a man so steeped in the lore of the Church enriched the experience tenfold.

It was nearly my first visit to Rome and it proved to be Abbot Cabrol's last. I think he was glad to have the opportunity to make it. In the Italian sun—the fierce Roman sun of late June—he shed years of his age and was almost a different man from him whom I had first seen under grey November skies in England. He had always loved Italy, though born a Frenchman and living most of his life in France and England, and he had many friends in Rome.

He stayed as a guest in a monastery on the Aventine, on the far side of Rome from my hotel. I used to walk across the city between five and six in the morning, while the day was still cool, and talk with him in the courtyards and corridors of the monastery. However short the interval since our last meeting, he never failed to greet me with a radiant smile and a courteous solicitation for my well-being. At all times he listened with grave attention to what was said to him, leaning slightly forward in his chair with an expression of alert goodwill and an air of deep diplomatic wisdom entirely at one's service.

When the great day came for his Audience with the Pope, at which he was to present the Memorial in Latin, prepared under his supervision, on the world movement for Calendar Reform, we drove down from the

Aventine shortly after nine o'clock. In the carriage he told me that he had known the Pope more than 50 years ago, at Milan. They were both young men studying in the famous Ambrosian Library, where Ratti as Cardinal eventually became Librarian. Although there was in the Abbot's manner, as he told me this, all the reverence due from a servant of the Church to his spiritual lord, the Holy Father, there was also a simple human expectation of meeting a friend again after many years. Their ways had parted widely, Ratti following the path to the greatest position of authority the religious world has to offer, and Cabrol, by quieter ways, to the high places of scholarship. For all his perfect aspect of sincere humility, his serene self-effacement such as only the truest servants of religion achieve, it was evident that Cabrol knew he was one who could speak with the Pope as a friend and even as a colleague.

Arrived at St. Peter's, we left the carriage in the Piazza and went to the door of the Pope's private apartments. A Swiss Guard in the gorgeous antique Papal livery took the card summoning the Abbot to Audience and led him inside. We had arranged to meet under the Portico in an hour's time, but in the meantime I would go to one of the cafés at the entrance to the Piazza. The Audience would not be more than half an hour, but the Abbot said there was likely to be considerable delay before he saw the Pope.

As it turned out he went immediately to his Audience. I was still in the café when, to my astonishment, I saw the Abbot hurrying across the great Square in the blazing sunshine. He came straight into the café—much to the excitement of the proprietor who seldom received such dignitaries of the Church—and began instantly to recount what had passed.

He told me how the Pope had enchanted him by asking after his invalid sister in the South of France and had presented him with a brooch to take to her with his blessing; how they discussed old friends in Milan; how the Pope had enquired minutely after the welfare of the Abbey at Farnborough, had referred to several of the Abbot's books, notably the great *Dictionnaire d'Archéologie*, and had expressed his admiration for England and his wish to have lived there; how the Abbot had then presented the Memorial on Calendar Reform, together with a special note of his own on the liturgical aspects of the fixation of religious feasts, whereupon the Pope immediately revealed a knowledge of the proposed reform and said that he watched the progress of the movement continually.

We talked for an hour or more, the Abbot with the vivid animation of one who had come from a great experience. His enthusiasm was remarkable—his whole heart was in the matter—his eyes shone and he was as eager as a boy to impart his excitement.

The great heat of noon lay over the streets when we came out of the café, and as my hotel was nearer than the monastery, we drove there to lunch, returning to the Aventine in the cool of a Roman evening.

LEAGUE ACTION INTERPRETED

A Study and Appraisal of the Action Taken at the League of Nations in September, 1937

By AN ENGLISH OBSERVER AT GENEVA

Fresh from the deliberations of the Council of the League of Nations at Geneva, the author sums up the League's action on Calendar Reform at the Council meeting held September 16, 1937. In this article he indicates the precise significance of the votes and reports presented in the official minutes of the Council, which are given textually on pages 129 to 134.

VERY definite progress in the movement for Calendar Reform was revealed by the discussions of the Transit and Communications Committee at Geneva in September. Such an assertion may at first sight appear paradoxical in view of the published statements to the effect that the subject had been removed until further notice from the agenda of the League of Nations.

But it is necessary to look below the surface of events if one is to read the true significance of superficial happenings, and those of us who were aware of the undercurrents and cross-currents flowing at Geneva and elsewhere during the period of the Committee's meeting know that the auguries for reform of the calendar are better today than at any time in the past six years.

Let me first summarize the report of the Committee before proceeding to consider it objectively and dispassionately. After calling attention, in turn, to the favorable resolution passed by the International Labour Conference in June 1936, to the draft convention presented by the Chilean delegate and to the action taken by the League Council in January and May 1937, with a view to obtaining a report before September 10th, the document states that 32 replies have been received to the circular letter addressed to the Governments inviting their observations on the draft convention. It then points out that "*it is superfluous to recapitulate the incontestable advantages from the social and economic point of view presented alike by the simplification of the Gregorian Calendar and the stabilization of movable feasts,*" and adds, in effect, that the only reform favored by the League is The World Calendar. (This is a proper interpretation of the Committee's characteristically non-committal phraseology: "*of a great number of proposals . . . of which the proposal presented by the Chilean delegate is not the least interesting.*")

The report then points out that such a reform cannot be contemplated

unless it meets with an almost unanimous approval and analyzes the tenor of the 32 replies received as follows:

- 10 states accept the Chilean proposal, at least in principle.
- 5 states declare themselves definitely opposed to the proposal.
- 6 states offer no remarks.
- 7 states cannot define their attitude for the moment.
- 4 states declare the reform would appear to them premature.

We then come to the most significant passage in the report—the attitude of the religious authorities. Attention is called to the well-known fact that, on the question of stabilization of the movable feasts, the Orthodox and Protestant churches had given their assent subject to the consent of all the Christian churches. There follows a somewhat obscure passage relating to the attitude of the Holy See, from which it appears that:

- (1) Stabilization of movable feasts cannot be separated from calendar reform, but that such stabilization would have to be subject to the meeting of an Oecumenical Council.
- (2) As regards the reform of the Gregorian calendar, the introduction of blank days would cause a break in the continuity of the weeks and would be incompatible with venerable and ancient traditions.

For these reasons, the report concludes, the Committee thinks the time inopportune for a conference of the nations, which, *in present circumstances*, would not appear to have any prospect of achieving its object, and recommends that, *until further notice*, there is no reason to retain the question on the agenda.

I should perhaps emphasize at this point what is made evident by the phrases I have italicized in the previous sentence, that the question on which the Transit Committee was asked to advise the League Council was *whether the time was opportune* for the summoning of a world conference to adopt the Chilean convention. This is the question that the Committee answered in the negative, as in the immediate circumstances they were bound to do, and the decision to remove the question for the time being from the agenda of the Council was a natural and inevitable corollary.

But what are the positive results of the Committee's deliberations? A number of wholly definite and satisfactory points emerge, in my opinion, from the report, which, it must be borne in mind, has been accepted and endorsed by the Council of the League.

First, the League for the first time acknowledges that it is superfluous to recapitulate the incontestable advantages of Calendar Reform.

Second, the League accepts the view that of all the proposals that have been considered The World Calendar is "not the least interesting."

Third, of 32 states that have expressed their views on the subject, only 5 are definitely opposed. This is a fact of deep significance.

Fourth, most of the states that say they are unable to define their attitude for the moment are hesitating owing to the attitude of the Roman

Catholic Church as expressed in a communication addressed to various governments by the Apostolic Nuncios.

Fifth, the Holy See, as was pointed out by the representative of Uruguay, does not close the door to reform. On the contrary, it opens it. It has indicated that stabilization of the movable feasts is inseparable from general reform of the Calendar and that its proposals on the subject of stabilization must receive the assent of a representative assembly of the Roman Catholic Church. ("Such stabilization would have to be subject to the meeting of an Oecumenical Council".) Clearly, the Holy See would not have given any such definite indication of its attitude unless it intended to devote serious consideration to the question, with a view to giving an authoritative lead to the Council when the time arrives. Accordingly it has pointed out certain obstacles to a quick decision, and the States that have conformed with the suggestion contained in the Nuncios' communiqués have significantly indicated that they cannot define their attitude *for the time being*.

* * * * *

Only those who hoped that the walls of Jericho would fall at the first blast of the trumpet can fail to recognize that the work of the League for the cause of Calendar Reform this year has served to register a definite step forward. I myself, as one who has been associated with the movement for reform for many years, never expected that the rapid progress that has been made since the Santiago Conference could actually bring about the introduction of reform so soon as January 1st, 1939. Too much was at stake, too many authorities were concerned for general agreement in so short a time on a matter that involves civil, religious and scientific entities throughout the world. But the meetings of the League and its associated organizations and committees have served the admirable purpose of not only focussing the attention of the world upon the defects of the Gregorian Calendar, but also of registering the considerable advance in world opinion that has been made since the Conference of 1931.

One of the most important developments has been the emergence of The World Calendar as the only scheme of reform regarded as worthy of practical consideration. The progress of the movement was long hampered and retarded by the existence of many fantastic schemes that enabled responsible people to postpone consideration of reform on the ground that those who sponsored a rectification of the calendar could not agree among themselves as to how such rectification could be best brought about. That retort is no longer admissible. Today one plan alone holds the field. The need for reform is officially recognized by the Council of the League of Nations. The method of reform is indicated in the report which it unanimously adopted in September 1937. These are established facts.

Of no less significance is the reception given by the *London Times* to the two books on Calendar Reform by Miss Elisabeth Achelis and Mr. P. W. Wilson, which were published in Great Britain on the eve of the League of Nations' meetings. The *Times* took the course most unusual to it of printing not only a lengthy review of the two books in its literary columns, but a weighty leading article commending to its readers perusal of the books, and, indeed, commanding The World Calendar itself to its

readers. "Finance, commerce and industry," urged the *Times*, "would benefit by the simplicity of reckoning the recurrence of periods of work and of rest, and the stricter correspondence between the quarters in one year and every other year. . . . Opposition to the reform in this country is not likely to be acute. . . . The English popular mind has changed since the mob (egged on by political schemes) demanded back the eleven days knocked out of the September of 1752 when England—170 years late—adopted the Gregorian Calendar." In a matter of this kind the *Times* both reflects and leads public opinion in Great Britain and even outside Great Britain.

For the world's leading newspaper thus to espouse the cause of The World Calendar—and incidentally to reject the suggestion for a 13-month year—marks a step forward hardly less decisive or less triumphant than the recognition accorded to it by the League of Nations itself. Nor has the importance of support given to The World Calendar been lost upon the authorities immediately concerned. Any movement which aims at a modification of the present calendar must necessarily be of special interest to the Roman Catholic community the world over, for it was a Roman Pope who introduced and gave his name to the Gregorian Calendar that we employ. There has been a great awakening of interest in the calendar during the past few years among prelates and priests and lay members of the Church and in many countries. It is evident, too, that the Vatican is not unaware of the interest that the subject has aroused, more especially in the Roman Catholic nations of Europe and Latin America.

If it is possible for an outside observer to read between the lines, I would hazard the opinion that the Vatican is undoubtedly impressed by the progress made in the movement for reform in countries that contain powerful Roman Catholic elements. It is alive to the size and scope of the movement and recognizes that there is also a very strong demand for action to be taken on the cognate question of a fixed Easter. In the face of these world movements the Holy See is not likely to content itself with the position of an onlooker. The Calendar is a vital concern of the Roman Church, and it cannot and will not stand aloof from deliberations concerning its reform. Nor is it in the tradition of that great and august Power to oppose itself to progressive reform when the time has arrived to depart from established practices that have outgrown their usefulness.

Calendar Reform remains on the list of projects under the consideration of the League of Nations. The decision taken in September amounts to nothing more than a postponement of the International Conference which will be necessary to record general acceptance of reform when the time comes. This is needless to say that the League Council can take up the question again at a moment's notice on the initiative of any member nation.

The next act in the long drama of Calendar Reform will be the development of a clearer and more authoritative urge for action among individual nations and among the leaders of national and international thought. Every year the trend to a more rational order of Time grows wider and deeper, and the churches, the education authorities, the representatives of scientific, professional, industrial and commercial opinion who advocate reform will not fail to make their wishes known. The League has given a mandate to The World Calendar, and it rests with progressive Governments to make that mandate effective.

AT THE LEAGUE OF NATIONS

Official Report of The Council Proceedings, Geneva, September, 1937

(League of Nations Documents C.380, M.256 and C.385, 1937, VIII)

THE QUESTION of the Reform of the Calendar having been inscribed on the agenda of the 98th session of the Council, the Secretary-General has the honor to communicate below to the Council the resolution on the subject adopted by the Advisory and Technical Committee for Communications and Transit on September 4th, 1937.

The Advisory and Technical Committee,

Considering the conclusions of the Fourth General Conference on Communications and Transit in 1931 regarding the simplification of the Gregorian calendar and the stabilization of movable feasts;

Considering the resolution adopted by the International Labour Conference on June 24, 1936;

Considering the draft Convention for the Reform of the Calendar submitted to the Council by the representative of Chile;

Considering the Council's decisions of January 25 and May 27, 1937, by which the Committee was instructed to examine the aforesaid draft in the light of the Governments' observations and to report to the Council before September 10, 1937;

Considering the circular letter of March 12, 1937, in which the Secretary-General of the League of Nations asked all the Governments of States Members and non-members to forward to him, if possible before August 1, 1937, any observations which they might have to make with regard to this draft;

Considering the replies sent to the Secretariat by thirty-two Governments;

Whereas it is needless to capitulate once more the unquestionable advantages from an economic and social point of view both of a simplification of the Gregorian calendar and a stabilization of movable feasts;

Whereas the League of Nations has already had a large number of schemes for the reform of the calendar submitted to it, not the least interesting of which is that submitted by the Chilean representative;

But whereas such reform can only be contemplated if it meets with quasi-unanimous approval;

Whereas the thirty-two replies received by the Secretariat may be classified as follows:

Approve, at any rate in principle, of the Chilean proposal: *ten States.*

Definitely opposed to this scheme: *five States.*

No observations to submit: *six States.*

Unable for the time being to take a decision in the matter: *seven States.*

Consider that it would be premature to introduce the reform: *four States.*

Whereas it is thus clear from the replies so far received that quasi-unanimity among the Governments consulted has not been attained and does not seem to be near attainment, more particularly as thirty-seven of the sixty-nine States consulted have not yet replied;

Whereas, furthermore, in the course of the examination previously made of this question, the organs of the League of Nations have always deemed it desirable to take account of the views of religious authorities;

Whereas, in this connection most of the Orthodox and Protestant Churches have already stated that they have no objection to the stabilization of movable feasts, though such stabilization, they declare, should be subject to the consent of all the Christian Churches;

Whereas, as is clear from the information conveyed to the Committee by several of its members, the Holy See, after having previously stated that it could not consider

any change in the date of the movable feasts, has taken up an even more definite attitude during the present year in that it has approached certain Governments stressing more particularly: (1) that the stabilization of movable feasts could not be separated from calendar reform, but such stabilization should be conditional on the meeting of an Ecumenical Council; (2) that, as regards the reform of the Gregorian calendar, the introduction of blank days would result in breaking the continuity of the weeks and be incompatible with venerable and long-established traditions;

For these reasons:

Considers that it is not expedient for the time being to contemplate convening a conference to carry out a reform which in present circumstances would seem to have no chance of being accepted and that, under such conditions, it is unnecessary, until further notice, to retain the question on the Agenda.

The resolution was submitted to the Council with the following report by M. Litvinoff of Russia:

"My colleagues will recollect that the Council decided on May 27, 1937 (97th Session), to hold over the question of calendar reform till its September session, as the Advisory and Technical Committee for Communications and Transit had in the meantime to study the draft Convention submitted in January, 1937, by the representative of Chile, in the light of the observations received from Governments and with reference to the resolution of the International Labour Conference.

"The Advisory and Technical Committee now reports to the Council, in the form of a resolution, that the Committee has come to the conclusion that it is not expedient, for the time being, to contemplate convening a Conference to carry out a reform which in present circumstances would seem to have no chance of being accepted. The Committee therefore considers that it is unnecessary, until further notice, to retain the question on the Agenda.

"In view of the Committee's conclusions, I propose that the Council should not proceed for the time being with the examination of the question of calendar reform and accordingly suggest that it should remove the question from its Agenda. Needless to say the Council could take up the question again if circumstances should, at a later date, be more favorable."

The proposal was adopted.

Governments replying to the League's circular letter of inquiry answered as follows:

Argentine Republic (July 26, 1937) The Argentine Government has given the question of the reform of the Gregorian calendar its careful consideration in view of the advantages which it is desired to obtain. It points out, however, with regard to the draft Convention submitted to the Council by the representative of Chile, that this reform is not considered desirable; for it considers, in principle, that the present continuity of weeks should be maintained and should not be interrupted by the insertion of blank days not included in the ordinary week.

Australia (May 3, 1937) The Australian Government has no observations to offer on the draft Convention communicated to the Council by the representative of Chile and would be prepared to give further consideration to the matter if there were any prospect of general agreement being reached on the subject.

Brazil (July 1, 1937) The Brazilian Public Administration has given careful

consideration to this matter, and an Inter-Ministerial Commission, on which the clergy were represented, was set up to study the Chilean proposal. As the outcome of this examination, the Brazilian Government is prepared to agree in principle to the draft Convention submitted by the Chilean Government, while reserving the right to take part in the discussion of the draft. The Brazilian Government desires to submit one observation forthwith regarding the "Description of The World Calendar" attached to the draft Convention. In the third paragraph, it is stated that the intercalary or stabilizing days, tabulated as December Y and June 1, or December 31st and June 31st, will probably be observed as international holidays. The Brazilian Government suggests that these two days should be made *compulsory* international holidays, for which purpose a provision to this effect would have to be inserted in the text of the Convention. This suggestion is justified by the legal, commercial and statistical advantages which would result.

Bulgaria (July 29, 1937) The Bulgarian Government is still studying the reform proposed by the representative of Chile. But as there are, above all, religious considerations involved in the question, it has also been submitted for examination to the Holy Synod of the Bulgarian Orthodox Church, which, in its turn, is anxious to obtain the views of all the Orthodox Churches, whose replies have not yet been received. Pending the receipt of these replies, which will undoubtedly throw light on the question as a whole, the Bulgarian Government is unfortunately for the moment unable to offer any observations on the matter.

Chile (May 24, 1937) The Chilean Government, having authorized its representative on the Council of the League of Nations to present the draft in question, confirms its complete agreement with the terms of the draft Convention intended to solve the difficulties of an administrative, commercial, economic and educational character which arise from the present Gregorian calendar.

Czechoslovakia (August 28, 1937) The Government of the Republic of Czechoslovakia regrets it is unable at the moment to communicate its observations on the subject of the proposed reform of the calendar, the competent authorities and the people interested not yet having been able to ascertain the consequences which this reform might entail in public life and in the functioning of public administration in Czechoslovakia. As soon as the examination of the problem is at an end, the Government will certainly examine the draft Convention in question and communicate its point of view.

Denmark (August 17, 1937) The Danish Government does not wish to make any observations on the draft Convention on calendar reform communicated to the Council by the representative of Chile.

Egypt (August 23, 1937) The Royal Ministry desires to inform the Secretary-General that this question is still being examined. It will not fail to communicate to him the observations which the competent authorities have to make on the draft Convention in question as soon as it is in a position to do so.

Estonia (July 29, 1937) After examining with the greatest interest the draft Convention, the Estonian Government approves of the action taken in the matter and is prepared in principle to co-operate in the realization of the proposal. Nevertheless, the application of the suggested reform of the calendar would be of practical value only if it were accepted by all or the vast majority of countries. Should there be any likelihood of this, the Estonian Government will be prepared to go more fully into the question with a view to Estonia's accession to the Convention for the Reform of the Calendar.

Finland (August 12, 1937) The Finnish Government has noted with great interest the draft Convention on Calendar Reform communicated to the Council by the Chilean representative, and will again give it their favorable consideration as soon as the Great Powers have decided to apply it.

France (August 4, 1937) The Ministry for Foreign Affairs has taken note of the draft with interest. The Government of the Republic considers, however, that the exhaustive examination of the proposals in question should be postponed until the Powers have agreed to stabilize the festival of Easter.

Greece (August 20, 1937) The Greek Government would, in principle, be in favor of the acceptance of the draft Convention on Calendar Reform communicated to the Council by the representative of Chile, but with the explicit reservation that this proposal be signed and ratified by all States Members of the League. The Royal Government considers that this condition is indispensable to the acceptance of the reform by the Greek people, who have strong feelings about their calendar and especially their religious feasts.

Hungary (August 31, 1937) The Royal Hungarian Government has no objection in principle with regard to calendar reform, particularly the stabilization of Easter. However, as Hungary has a Catholic majority, the Government must bring its attitude in religious matters into line with the dominating opinion in the country. It therefore considers it important that the problem in question be settled in harmony with the intentions of the Holy See.

Iceland (August 17, 1937) The Government of Iceland does not wish to make any observations on the draft Convention on Calendar Reform communicated to the Council by the representative of Chile.

India (June 10, 1937) The Government of India communicated that, in its opinion, previous exploration of the question of calendar reform has conclusively demonstrated that no result of any appreciable value is calculated to accrue therefrom. It therefore favors the abandonment of the proposal to promote a convention on the subject.

Latvia (August 11, 1937) The question of calendar reform being of interest to the most varied circles, the Latvian Government has undertaken a wide enquiry, which is not yet completed. They will not fail to communicate to the Secretary-General as soon as possible the conclusions which may be drawn from the results of this enquiry.

Liechtenstein (March 18, 1937) The Government of the Principality has no observations to make with regard to the proposed reform of the calendar.

Mexico (August 17, 1937) On receipt of the draft Convention communicated to the Council by the Chilean representative, the Ministry for Foreign Affairs invited the Executive Departments to study the question and to give their opinion on it. Further, the Director of the Observatory, who is at the same time Chairman of the Mexican Committee for Calendar Reform, took part in the discussions of these departments. The conclusions at which they arrived can be summarized as follows: "Having examined the proposals for reform, the Commissioners were of the opinion that it was desirable to accept the proposal involving the maintenance of the present division of the year into twelve months, but according to which the days would be arranged in the following way: The first month of each quarter (January, April, July and October) would contain 31 days, and the other months 30 days. The quarter would begin on a Sunday and contain 91 days in all, of which 78 would be working-days and 13 holidays. To the days of the year arranged as above, a day would be added after December 30th, which would not bear the name of a week-day, but be called 'year-end day'. In leap years, a second day would be added after June 30th, which would be called 'leap-year day'. Both these days would be holidays." The question was then submitted to the President of the Republic, who gave instructions to the Ministry for Foreign Affairs that Mexico should support the draft reform referred to above when the question of calendar reform was discussed.

Netherlands (July 20, 1937) The Government of the Netherlands would recall that in 1931 it transmitted to the Secretary-General of the League of Nations the report of the Netherlands National Committee for the Study of the Reform of the Calendar, which report the Royal Government endorsed. The principal conclusions of this report were as follows: (1) Gregorian calendar to be maintained; (2) Minor adjustments would be acceptable; (3) The principle of the blank day is rejected; (4) Even if the blank day were to be accepted by the international community, the division of the year into thirteen months should be rejected; (5) The fixing of Easter between April 8th and 15th might be accepted. The Royal Netherlands Government's views have not changed since that date. As regards, in particular, the scheme submitted by the Chilean representative, the Royal Netherlands Government has carefully examined it. It regrets, to say, however, that, in its opinion, the advantages of the revised calendar

would not make up for the serious drawbacks in several respects which would be involved by an interruption of the continuity of the present calendar.

Norway (September 1, 1937) The Norwegian Government accedes to the draft Convention communicated to the Council by the representative of Chile, on condition that this reform is adopted internationally. The Norwegian Government supposes that, in that case, the question of the stabilization of movable feasts would be the subject of a separate discussion at a later date.

Panama (June 28, 1937) The Government has instructed the delegate of Panama to the League of Nations to support the calling of a conference to adopt a new world calendar.

Peru (July 29, 1937) The Peruvian Government has decided to adhere, with reservations, to the draft Convention on the Reform of the Calendar, the period for the ratification of which expires on August 1st next.

Poland (August 9, 1937) The Polish Government has no observation to offer at present on the draft Convention for the Reform of the Calendar submitted by the Chilean delegation. It considers, however, that, as the possible application of a reform of the calendar would necessitate lengthy preparatory work of a legal nature in the countries concerned, the time limit of January 1st, 1939, proposed in the draft Convention is undoubtedly premature.

Roumania (August 27, 1937) The Roumanian Government, despite its interest in the question of calendar reform and in the Chilean proposal, cannot at the moment agree to the suggested reform, in view of the opposition of the National Church. The Roumanian Church does not accept the proposal in question for scientific and astronomical, as well as for practical and religious, reasons.

Siam (July 17, 1937) His Majesty's Government has no observations to make on the draft Convention for the Reform of the Calendar.

Spain (August 16, 1937) The Spanish Government has informed the Secretary-General that, after having consulted the competent authorities, it has no objection to acceding to the draft Convention communicated to the Council by the Chilean representative, although it points out that serious difficulties would arise in international postal connections if the modification proposed were not adopted unanimously and made compulsory in all countries. The Spanish Government recalls the historical antecedents of the reform and the various solutions which have been suggested to the League of Nations, and on which it has already communicated its observations. The reasons which have led it to form the opinion given above are the following: (1) The draft Convention was proposed by plenipotentiaries. (2) The solution now put forward is superior to all others suggested up to the present, in view of the fact that it divides the year into equal half-years and quarters and fixes in a uniform way the position of the days of the week for all years and quarters to come. The division of the days of the year would create fewer difficulties for the interconnection between the Gregorian calendar and the reformed calendar, thus facilitating the comparison of observations and work carried out, and the collection of statistics of all kinds with the greatest possible accuracy.

Sweden (August 24, 1937) The draft Convention on Calendar Reform put before the Council by the representative of Chile has been carefully examined by those interested in the subject in Sweden. It would appear from this examination that the advantages which might result from a reform of the calendar on the lines of the above proposal would hardly outweigh its drawbacks. In the circumstances, the Swedish Government regrets that it is unable to recommend the adoption of the draft Convention in question.

Switzerland (August 13, 1937) The Federal Authorities have submitted the draft Convention to the Swiss Committee for the Reform of the Calendar; the latter has set down its views on the draft in question in the report which the Department encloses, in case it may be of interest to the Secretariat of the League of Nations. Notwithstanding this communication, which is purely technical, the Swiss Federal Council must for the time being reserve its final decision regarding the desirability of a reform of the calendar. It will not be in a position to adopt a definite attitude in this matter

until it has learnt the opinion of the principal Churches, and of the Governments of countries with which it would be inconvenient for Switzerland not to have a common measure of time.

Union of South Africa (July 13, 1937) The Government of the Union of South Africa consider that public demand for the reform of the calendar is not yet sufficiently widespread to warrant a draft Convention in that regard being concluded. They feel, moreover, that the fixation of Easter by international accord should precede the consideration of the wider question of calendar reform.

Union of Soviet Socialist Republics (August 15, 1937) The People's Commissariat has communicated to the competent authorities of the Union of Soviet Socialist Republics the draft Convention put forward by the Chilean representative. The observations made by those authorities will immediately be brought to the notice of the Secretary-General in the event of the present enquiry showing that it is desirable to carry out the proposed reform at the moment.

United Kingdom of Great Britain and Northern Ireland (April 22, 1937) The Government of the United Kingdom are of the opinion that any consideration of the draft Convention would be premature pending further discussion of the principle involved in the reform of the calendar and of the particular method of reform to be adopted. They consider that the time will not be ripe for any further examination of the matter by the League until propaganda by those in favor of the alteration of the calendar has achieved more widespread and solid results than it has hitherto. His Majesty's Government in the United Kingdom remain of the opinion that, until the fixation of Easter has been achieved internationally, no useful purpose is served by attempting to proceed with the larger question of calendar reform.

United States of America (June 25, 1937) The Government of the United States of America has no observation to make upon the draft Convention communicated to the Council by the representative of Chile. It expressed the wish, however, to be advised of any inter-Governmental conference which may be held to consider this matter, in order that the question of representation may be considered.

Uruguay (Opinion received too late for inclusion in League report). The Government of Uruguay has resolved that its delegates to the Assembly of the League of Nations shall support the proposal presented by the Government of Chile on calendar reform.

ADDITIONAL OBITUARY NOTES

P. H. WATIER, director of the Transit and Communications Organization of the League of Nations, died suddenly in Geneva on August 20. He entered on his duties with the League of Nations in February, and had enthusiastically undertaken the task of leadership in calendar reform, in preparation for the fall meetings of his section and of the League Council. His death was a sudden and unexpected loss to the cause of calendar reform.

D OCTOR WALTER SIMONS, former president of the German Supreme Court, and one-time interim president of Germany, died on July 15, at his home in Nowawes, near Berlin, aged 75. He was a long-time member of The World Calendar Association, and wrote an article for the October, 1936, issue of the *Journal of Calendar Reform*, in which he urged the League of Nations to move more actively into international leadership for calendar revision.

D R. J. K. FOTHERINGHAM, professor of astronomy at Oxford University, died in England on December 12, 1936. "The mental range of this scholar," says a writer in *Nature*, "probably exceeded that of any one of his contemporaries." His interest in calendar reform was of long standing. An article by him on "Intercalary History" appeared in the *Journal of Calendar Reform* in December, 1933.

PRESS APPLAUDS EDUCATORS

ACTION of the National Education Association, at its Detroit Convention, July 1, 1937, approving of calendar reform, has received enthusiastic comment from editorial writers throughout the United States. The N. E. A. report was printed textually in the July issue of the *Journal of Calendar Reform*. Newspaper editors, in commenting on the report, direct attention to the fact that schools and colleges suffer more than any other group of institutions from the vagaries and irregularities of the present calendar, and therefore have a right to be heard when a change in the calendar system is under discussion.

"It is not strange," says the *Providence Journal*, "that the advantages of The World Calendar should be recognized by educators as a means of securing regularity in the school routine. And the same advantages are assured to the people in all walks of life." And the *Scranton Tribune* adds: "Educational institutions, which now open on various dates, would find the problem of simultaneous opening simplified."

Says the *Wilkes-Barre Record*: "As for the peculiar advantages educationally, the committee finds that the schools would be relieved of the necessity of giving instruction in the different lengths of months which have no significance for most children in our schools, and the calendar would be brought within the framework of orderly arithmetic. A perpetual calendar would enable the schools to work out their educational almanac, not only for the year in question, but for years to come. Many arrangements would be as perpetual as the calendar itself. The elimination of the wandering week would be a great advance in the right direction. Take the case of schools which reopen on the Tuesday after Labor Day. Reopening is now dated from September 2 to September 9 inclusive. With a World Calendar, the date of reopening would be September 5. The task of arranging the required number of teaching days within the school year would be standardized and simplified. Holidays might sometimes intrude themselves into the middle of the week, but they could not wander all over the week."

The *Newport (R. I.) News* is happy to find American teachers joining in the movement for a simplification of the calendar. "The N.E.A. committee, with no restrictions on their study, decided that the plan offered by The World Calendar Association was the ideal one from the educator's viewpoint. . . . The committee naturally considered the matter from the standpoint of education. They reported that a perpetual calendar such as this would enable teachers to work out their educational almanac for years to come. The reform would eliminate the so-called wandering week, and this alone would be a long advance in the right direction. . . . The addi-

tion of the National Education Association to the growing list of organizations in this country that approve not only a change from the present system, but also the adoption of The World Calendar itself, should add weight to the influence already being brought to bear on the State Department for some action."

Endorsement by educators is a challenge to other organizations and groups, says the Clarksville (Tenn.) *Leaf-Chronicle*. "As the report sets out, there are several advantages to be gained from the proposed reform. It would abolish the wandering week and provide for a perpetual almanac. It would equalize the half-years and quarters. It would regularize the months. And of interest to many working people, holidays would come on a fixed date that could be anticipated years in advance. . . . This thing we call the calendar has been a challenge to man ever since he began to take notice of time and first sought a unit by which to measure it. The day is founded on the revolution of the earth making night and day. The year is founded on the journey of the earth around the sun. And according to astronomy there can never be a calendar in which a year can be measured in an exact number of days. But with adoption of The World Calendar, we can discard the old rhyme which begins 'Thirty days hath September.'"

Teachers have pointed out a subject that everybody ought to know and think about, says the *Washington Star*. "Improvement of the calendar is a perennial theme for scholars. The question has been debated for centuries. Our present calendar is distinguished by seemingly unavoidable irregularities and inconveniences. A schedule in which are included seven months of 31 days, four of 30 days and one of 28 or 29 days, certainly is provocative of confusion in the arithmetic of history, economics, sociology and culture. . . . What appears to be wanted is a standardized and perpetual regulation of the prevailing differential between lunar months and solar years. To meet the requirement The World Calendar has been devised. Even brief study of the proposal will convince the average thoughtful citizen that it has merit. At least, it would be constant. It would not change each year. Moreover, it would regulate Sundays and holidays conveniently. The National Education Association believes it would be an improvement."

Says the *Portland (Maine) Press Herald*: "There have been numerous proposals to amend the calendar. After investigating them, a committee of the National Education Association recommends The World Calendar, authorized by the League of Nations and proposed for international adoption at the beginning of 1939. Maine, for one state, heartily approves."

"A thoughtful survey", is the verdict of the *Providence Journal* on the N.E.A. report. The editor of this newspaper is particularly impressed with the committee's definite action against the 13-month scheme. "Every

feature of the two conflicting plans was thoroughly scrutinized and the relative advantages and disadvantages soberly weighed. The result was approval of the 12-month system and rejection of the 13-month calendar. And the reasons adduced for this conclusion leave no room for logical argument by the advocates of the 13-month plan. . . . The committee of educators surveyed the whole history of calendrical arrangements from the period of the ancient Egyptians. Their first conclusion was that the establishment of an 'ideal calendar' is impossible, but that the present Gregorian system (with certain possible modifications) supplies the nearest possible approximation to that ideal. Within the excellent structure of the Gregorian year there are certain existing inconsistencies, anomalies and inconveniences. It is in the hope of remedying these that the subject of calendar reform is so urgently agitated."

Stabilization of holidays appeals to several Maine editors, because Maine is a state that makes tourist traffic one of its main industries. The *Augusta Kennebec Journal*, for example, applauds the action of the National Education Association, and hopes that adoption of The World Calendar will lead to an even further improvement in the incidence of holidays. "There will be the usual objections to any change, on the same ground that was taken in the matter of daylight saving—that it is interference with 'God's time'. But since a calendar, like standard time, is but an invention of man for his own convenience, a change is not incompatible with religious propriety. The main thing to consider is whether The World Calendar would be an improvement over what we now have. Of this there is abundant evidence."

The educational committee is right in attaching importance to the inefficiency of the present calendar, says the *Easton (Pa.) Express*. "To persons who have never bothered to inquire very closely into the workings of the solar system, annual changes in the calendar with the corresponding shifts in holidays, anniversaries and school openings, probably seem a little superfluous. The fact is, however, that such changes are not only desirable but essential to the workings of the present calendar. . . . The inconveniences, however, are extensive, and movements for calendar reform have come into being in recent years. One of the outstanding movements concerns itself with what is known as The World Calendar. According to the National Education Association, this is the most practical of any of the changes suggested. The wandering week would be abolished and the calendar would be made about as near permanent as possible. The State Department and the League of Nations are considering the subject, and the outcome of this internationally important movement will be interesting to watch."

PROF. SANTILLANA'S BOOK

FROM Buenos Aires comes a new book on calendar reform, entitled *El Actual Calendario Juliano-Gregoriano y Su Sensacional Reforma en el Año 1939*—“The Julian-Gregorian Calendar and Its Sensational Reform in the Year 1939.” The author is a distinguished Jesuit scholar, Father Santillana.

It carries the proper church imprimaturs: “Imprimi potest. Bonis Auris, 15 Octobris 1936. Thomas I. Travi, S.J., Praep. Prov. Argent.-Chil. . . . Imprimatur. Bonis Auris 21 Octobris 1936. Antonius Rocca, Ep. Augustae, Vic. Gen.” These mean that Father Santillana, a Jesuit and so a member of a religious order, has submitted his work both to his superior and to the Bishop of Buenos Aires, and that he has obtained assurance from the appointed censor in each case that there is nothing in the book contrary to the dogmas of the Church or to common Catholic teaching.

BY WAY OF PREFACE

To the Reader:

I owe you an explanation, and I must bring it forth at once. For I am thinking of the surprise which you will naturally feel upon reading the title of these pages, and still more upon reading the pages themselves. I shall therefore endeavor to give you some explanation of why I wrote them.

This is the first thing I have to say: that for 25 years I have been following up with the deepest interest the problem of calendar reform; and I have been doing so not through foolish curiosity, but because I am honestly convinced of its great desirability. This conviction rests on four distinct grounds: the movement to reform the calendar is altogether in accordance with reason, even demanded by reason; it is of the utmost usefulness in its objectives, particularly to the Church; it is quite practical, with no grave drawbacks; and, lastly, it will sooner or later meet with success, as has been the case with so many other things that had to be.

Along with my intense interest in the subject of calendar reform there has always gone the fear—and others have shared it with me—that the bigotry which accompanied the reform of the calendar in Revolutionary France might arise from its horrible ashes and endeavor, by reviving the attempts at reform, to attack the Church in some of her most sacred rights and privileges.

But when, in the last three movements to reform the calendar—those of the years 1911, 1928 and 1936—I noted with much satisfaction that the distinguished proponents of reform, far from displaying any anti-religious animus, directed their first steps toward the Vatican, to make reverent inquiry and to seek the opinion, aid and consent of the Holy See—when I noted this, I must confess that my former sympathy with the movements turned into a holy fervor, almost as though there were questions of a new papal reform.

Then, too, in 1911 I beheld the sainted Pontiff, Pius X, fearless and broad-minded as he was, give ear to proposals for reforming the Church calendar and entrust the study of the problem to scientific and ecclesiastical authorities of the highest competence. And now I read of the reply given by the Supreme Pontiff, Pius XI, so notable for his many projects and his boundless energy, to the official mission on calendar reform, headed by the Benedictine Abbot, Dom Fernand Cabrol.

When, finally, I read the Progress Report of the British organization that is urging the reform—the Rational Calendar Association—and noted all the details of the plan, the various facts and events connected with it, the authorities supporting it and the progress it had made in a few months, there came to my mind that other familiar quotation: *Veni, vidi, vici!* The hour is come! The plan which is only a proposal in 1936 can well be a reality in 1939.

Let me also say that I should like these brief pages to be a modest tribute to and a pleasant memento of the 25 years I have spent in the teaching of algebra and trigonometry, the sciences that are the basis of the astronomical calculations so necessary for arranging the days and the years in their proper calendrical sequence.

JOAQUIN SANTILLANA, S. J.
Colegio del Salvador, Callao 542. Buenos Aires, Oct. 12, 1936.

A NEW CALENDAR BY 1939

By J. SANTILLANA, S.J.

Professor of Mathematics, Colegio del Salvador, Buenos Aires

Selected chapters from Prof. Santillana's book (published in Buenos Aires, October, 1936), translated from the Spanish and adapted by Edward S. Schwegler.

I

THE PRESENT SITUATION

FROM London, a "Progress Report" of the Rational Calendar Association zealously proclaims a world crusade to hasten the introduction of the new calendar as proposed and defended by Lord Desborough in the British House of Lords.

The calendar has always been one of the most delicate problems of all ages and all peoples from the very dawn of history. We need only recall the great variety of calendars that, despite their imperfections and errors, still exist alongside the Gregorian among not a few peoples. One may also point to the frequency with which there appear among the cultured nations of Europe and America powerful movements for a reform of our calendar—and that not through caprice or love of novelty, but through a conviction that reform offers many positive advantages and is absolutely necessary.

It is evident that the world is not satisfied with its present calendar. And with reason, as I hope to show the reader of these pages, writing as I do because of the great interest and sympathy which this question has instilled in me during the last 25 years, and because of my conviction that, once this reform is brought about, the final solution of that eternal world problem which is the calendar will also be at hand.

But let the reader be the judge.

I now wish to make a point that is quite fundamental. There is a very definite and historical line of division between the various secular proposals to reform the calendar. Up to the time of the last reform—the Gregorian, in 1582—all the projects had to do with the essentially astronomical angle of the subject: with the calculation of the number of days and fractions of days that had to be given to each calendar year in order to make the civil year and the true or solar year correspond, and to coordinate the years with the centuries. But after the Gregorian Reform, which definitively solved the astronomical problem involved, all the projects for reform, and above all the three great movements of 1911, 1928 and 1936, look solely to the civil or social element of the question: that is, to the stabilization of the days in each month and to a rational and advantageous coordination of the months and quarters with the year. It is this which is proposed in the newest plan; and although one might think offhand that this angle of the matter is quite accidental and unimportant, the reader will see for himself that the proposed reform will introduce changes of the utmost consequence to human existence, whether social or religious.

Before treating our matter more fully, I think it advisable to present clearly and at some length certain general aspects and elements of the current reform proposals, in order that we may form a proper judgment of their significance and seriousness.

The bare mention of this question undoubtedly gives rise to varied and even con-

tradictory ideas among different classes of persons. In some it will produce surprise, as at a subject quite new—fallen, as it were, from the clouds. In others, on the contrary, it will give rise only to indifference, for such persons reason that the problem does not touch them in the one essential place, which is their pocketbooks. Then, there are those who know something about the problem. When they hear it mentioned, they smile benevolently and say: "Yes, yes—one more project, one more reform—and greater confusion than ever!"

But the great majority will greet the proposal with sublime nonchalance, as if to say, "If reform comes, then let it come!"

It seems to me that these general objections should at once be presented in their true light for the benefit of my readers, whose numbers I should naturally like to see increase: not so much for the sake of my book as for the sake of the subject which it treats.

As a matter of fact, then, our problem is not something new, or something that could not have been settled centuries ago in scientific and social circles. But at the present time it is of particular interest and importance, and is quite apt to meet with a complete solution very shortly. And in so necessary and urgent a proposal all of us should be extremely interested.

The whole question has been much raised and discussed already in the past century, and has given rise to powerful and widespread movements for reform. Evidently, as already pointed out, the world is not satisfied with its calendar, and with the way the days, months and larger periods of the civil year are arranged. And without a doubt, the world has much reason and solid arguments on its side, as we shall soon see.

So the proposal to amend the calendar is not something new. Nor is it something speculative and abstract, as some would think. Calendar reform is real and practical. It is of great importance in social life and would inaugurate notable and beneficial improvements, which should not be disregarded or put off.

The importance of the question springs from the fact that it touches upon one of the most delicate and paramount elements of our social life—the calculation and arrangement of time, of days and months and years—things that exercise so profound an influence in all spheres of human existence. Furthermore, the question is one that affects all the ages, not one that may be settled anew every hour, or even every century. Our present calendar has undergone only two reforms: the Julian, 20 centuries ago, brought about by Julius Caesar in the year 45 B. C., and the Gregorian, three and a half centuries ago, introduced by Pope Gregory XIII in the year 1582. Since then our calendar has not been touched. The reform of the French Revolution in 1793 was purely local and temporary. It quickly blew over, as did the Revolution itself—a brief squall of persecution and sectarianism.

The problem of calendar reform is one that should be handled officially and internationally by the various countries of the world. All the civilized nations at present use the Gregorian calendar, and all must therefore come together if a reform is to be inaugurated. As happened in previous movements for reform, the project is first studied and discussed by the League of Nations at Geneva, which then proposes the plan to the different governments. Subsequently, the League has the task of bringing about the approval and adoption of the proposed changes by the same governments.

At the same time, it should be evident that the Church and the Holy See can also take very effective part in the deliberations, on account of the ecclesiastical elements to be found in our present calendar, and of the latter's indelible Christian character. Our Lord Jesus Christ is the beginning and origin of our present Christian era; and the fixation of Easter is a fundamental point of the proposed reform, as Pius XI authoritatively indicated when the plan was set before him in all its details.

Another very important, not to say decisive factor in the success or failure of the reform, is public opinion, whether of scientists and technicians, of the educated generally, or, in proper measure, of the masses of the people. The British Government itself came to the conclusion that the adverse public opinion of the English people had caused the previous proposal of 1928 to be rejected. All of us, individuals and groups, must take part in the discussion, each one in his own sphere and in his own way.

It will be the duty of the different governments and of the intellectual classes to

enlighten, move, direct and watch this general public opinion. And it will be necessary to discuss the project widely through various publications and popular conferences, and particularly by means of ample treatment in the press. The latter should become convinced of the great importance of the question and of the relative speed with which it must be settled, since the reform ought to be introduced in 1939 if it is to enjoy the special circumstances connected with that year. (TRANSLATOR'S NOTE: The World Calendar and the Gregorian year 1939 both begin with Sunday.)

The many proposals for calendar reform previous to the present one have all ended in failure. At the bare mention of reform, therefore, many will, as I have already said, immediately conclude that the current plan will also fail of realization.

But the latest proposal has every indication and guarantee of quick favor and immediate success. The secular movement for reform has become quite powerful in very decided fashion. It is making greater and greater headway; it has progressed far in the few months since its presentation in the House of Lords at London; and it has been espoused by organizations and groups of the greatest influence, which praise it to the skies, insist that it has ideal chances of success, and pledge to it their absolute and unconditional support.

Among such groups, as already indicated, is the British House of Lords, where, in March, 1936, the plan was brought up for debate. The Government spokesman received the proposal most favorably and stated that, if the matter were taken into consideration by the League of Nations, it would have "the most sympathetic and serious consideration" of the Government.

Another influential group that has supported the plan is the International Labor Conference at Geneva. It has recommended the proposal to the League of Nations.

Similarly, the most authoritative Institutes and Societies of scientists, astronomers and statisticians have officially stated that the proposed reform eliminates the imperfections of previous plans and merits the utmost praise and support.

And, not to mention other official statements and testimonies, His Holiness Pope Pius XI, upon receiving a detailed memorial about the current plan, stated, as mentioned by Lord Desborough in the British House of Lords, that "the subject of calendar reform is viewed by the Vatican as a whole, and the question of Easter stabilization cannot be detached from the question of general reform."

Apart from this, the highest Catholic authorities on the subject of the calendar—like Dom Fernand Cabrol and the Abbé Chauve-Bertrand—have stated that there is nothing in either the doctrine of the liturgy of the Church which would militate against this reform, and that the proposed changes, far from offering difficulties, would be advantageous in many ways to the clergy.

Furthermore, as an indication of what is going on in many places, it will be enough to mention the fact that numerous British industrial organizations and chambers of commerce have unanimously adopted resolutions asking the British Government to use all its influence with the League of Nations in bringing about approval of the current plan by other countries.

But finally, there is something in the plan itself that may constitute its best and most solid guarantee of success. This is its practical common sense. The proposals take into account the difficulties and avoid the reefs that shipwrecked previous plans. The new champions of reform are satisfied with a reform that is moderate and sensible, that answers in all essential points the demands of the secular movement for change, and that prudently omits certain other possible elements or angles of the calendar which might theoretically be improved. These further possibilities of reform might be ideal if considered only in the abstract, but in the concrete they will always come into violent opposition with various traditions and prejudices which, though more or less illogical and pointless, are nevertheless quite definite and cannot be ignored.

From all this we may draw but one conclusion. We must face the problem that confronts us—a problem that is quite definite, vastly important and strongly insistent. We must face it with calm determination and clear

convictions. We must realize the necessity of solving it quickly and finally. And, at the same time, we must remain confident, with a confidence based on solid grounds, that very shortly this new plan will become a reality, and we shall have to consider the year of 12 months and four equal quarters as a part of our daily lives.

II

PROPOSALS FOR REFORM

(This is Chapter VII of Prof. Santillana's book.)

MOVEMENTS to reform the calendar, more or less dormant during the last two centuries, came to vigorous life at the beginning of the present century; but they had forms and aims that made them different both from the Gregorian and the French Revolutionary reforms. The Gregorian reform, directly and essentially, had to do with the astronomical aspect of the calendar and of the solar and civil year, whilst the spirit of the Revolutionary reform was simply sectarian and anti-Christian.

Neither the astronomical nor the sectarian element is to be found in the modern movements for calendar reform. These movements ignore entirely the astronomical aspect, and have as their sole end the rational and advantageous distribution of the days among the months. Indirectly, these modern movements have also two subsidiary, though also primary, aims. One is the fixation of Easter for the same day each year; the other, flowing from this, is the stabilization of each day in the year on the same day of the week. The results of the latter aim, as regards the division of the year into months, quarters and halves, have led me to call the latest reform proposal "sensational" in the title of this book. I have no fear that this statement will be contradicted by the judicious reader.

One who looks at the matter superficially, and does not get down to the bottom of the question, will think, at first sight, that the eagerness to introduce a new distribution of the days and the months, with all the disturbances and upheavals such a thing would entail throughout the world, is quite without justification or reason. But if one studies the question even cursorily, he will see that the most elementary logic and the consideration of all the positive advantages involved, far from giving rise to disturbances and difficulties, actually demand that this new distribution and coordination of days, months, quarters and halves in the year be adopted as soon as possible.

The reader will agree that the calendar and its various elements are among the most delicate, serious and scientific questions that affect human existence. Therefore, by all the rules of reason, they should be characterized by the utmost exactness and order. But what do we find? Our present calendar, in its distribution of days in the month and quarters of the year, is filled with inequalities and illogicalities. And when we seek the reason for this state of confusion, we find that there is absolutely no reason but the fact that our present distribution of the days arose from the stupid superstitions of a pagan people and the no less stupid vanity of imperial reformers. Are we not forced, then, by all proper and reasonable sentiments, to demand an immediate reform—to insist upon a change in the order of the days, months, halves and quarters that will be logical, orderly and beneficial?

Briefly, the facts are these. Because the Romans considered even numbers unlucky and odd numbers lucky, the first thing they attended to was that the months should all

have an odd number of days, as 27, 29 or 31. This accounts for the lengths of most of our months. Centuries later, Julius Caesar and Augustus introduced reforms of the calendar, and each dedicated a month to himself—July and August respectively. But their vanity was touched to the quick by the fact that their months had only 29 days, whilst other months had 31. So, disregarding the superstitions of the people, they decreed that their months should have the maximum number of 31 days: which made it necessary to give certain months the unlucky content of 30 days.

This, then, is the rigorous historical fact: that imperial vanity and popular superstition were the only norms for the length of the months.* And it will be a triumph of human intelligence when, in obedience solely to considerations of order and utility, the two halves and four quarters of the year have the same number of days, and the successive months in each quarter always count 31, 30 and 30 days respectively. Such a distribution of the days, in all its simplicity, can be introduced without any real disturbances ensuing, and would bring about many excellent and beneficial reforms in our social life. Both logic and practical advantage urgently demand that it take place with the utmost dispatch.

The proposed reform, besides bringing about a rational distribution of the days in the years and months, and a logical coordination of months, half-years and quarters, would introduce a fixed Easter, the stabilization of all the days in the year on the same day of the week, and the substitution of one single, perpetual calendar for the present different calendars that change each year. And all this can be brought about easily and simply, without any upheavals or difficulties, without any insurmountable obstacle, and in accordance with the demands of reason and science. Once more: the reform should be introduced without further delay.

III

THE REFORM MOVEMENT OF 1911

(This is Chapter XI of Prof. Santillana's book.)

AT THE end of February of the year 1911, L. M. Grosclaude presented to the Federal Council of Switzerland the results of various meetings that had been held by chambers of commerce in England and Germany for the purpose of discussing a proposed reform of the calendar. The Council decided to send inquiries to the governments of Europe about the possibility of calling together in Switzerland an international conference, the object of which would be a reform of the Gregorian calendar and the fixation of the Easter date.

At once numerous Catholics took up the proposals, and brought forth suggestions for making them acceptable to the Church. They sought thereby to counteract the sectarian machinations of her enemies, who might try to revive the ends and means of the calendar reform produced during the French Revolution.

But there was no ground for fears on this score. The supporters of the reform, who were Swiss Protestants, came forward in admirable fashion and courteously communicated with the Roman Pontiff. They explained all the points of the reform and assured the Holy See that nothing would be decided that might be contrary to ecclesiastical teaching; nay, that no decision whatsoever would be made without the advice and express approval of the Church authorities.

*TRANSLATOR'S NOTE: The popular explanation for the length of certain months will hardly bear historical examination. Quintilis, or July, had 31 days long before the Julian reform; and August had 31 days already in the Julian reform. However, about the other element in the length of the months that arouses Father Santillana's ire—the superstitious use of odd and even numbers—there seems to be no reasonable doubt.

Pius X did not become alarmed at the proposals, nor did he repel them. Taking into consideration their importance and their advantages, and also the imperative need of quick action under the circumstances, he resolved, with characteristic clear-sightedness and courage, to attack the problem squarely.

According to an account in the *Univers* of Paris, March 2, 1912, he delegated complete authority in the matter to a renowned and capable ecclesiastical scholar—the Benedictine Abbot, Dom Fernand Cabrol. Dom Cabrol was to institute a thorough study of the question, and then give a personal report of the whole matter to the Holy Father himself.

Dom Cabrol gathered together the results of his investigations in the *Revue du Clergé Français* for March 1, 1922. In an appendix to the article he drew up a long and select bibliography on the subject and on the projects for reform that had been proposed in the past—projects not much different from those which are proposed today.*

The idea of reforming the calendar spread rapidly throughout Spain, giving rise to many writings and conferences. Worthy of particular mention, both for its intrinsic merit and for its delineation of the reform movement in Spain, is the very learned and solid work written by Don Carlos de la Plaza y Salazar and published at Bilbao in 1912: *Calendar Reform Adapted to the Feasts and Solemnities of the Church*. In the same year a very timely and praiseworthy article came from the pen of the Rev. P. E. Portillo, S. J., appearing in the review *Razon y Fe*, on the same subject. Father Portillo was especially interested in safeguarding the Christian character and privileges of ecclesiastical feasts and in combating possible reforms that might be too hasty, or might proceed from evil intentions.

There were other echoes of the world movement for calendar reform in the different Catholic reviews of Europe. The writers defended the idea of reform in its general aspects, but they were fearful lest its advocates might be inspired by the sectarian designs that marked the calendar reform of the French Revolution.

In addition to the articles of Dom Cabrol and Father Portillo, already mentioned, notice should also be given to an article in the review *Sal Terrae* by Father Vililarino, S. J.

These articles, along with their marked leaning towards and sympathy for calendar reform, and a certain amount of concomitant hesitation, evinced the sincere conviction that, if the reform were properly directed in accordance with the principles and rights of the Church, it would offer no difficulties. "And," wrote Father Portillo, "if a Pope needs courage to decide such a question, the courage would not seem to be lacking in the reigning pontiff, His Holiness Pius X, who, with holy intrepidity, is bringing to a happy conclusion reforms in ecclesiastical discipline that 25 years ago would doubtless have been considered impractical."†

By 1914 the movement for calendar reform had become powerful and world-wide. But then it was swept aside by another immense and irresistible movement: the Great War. During the four years of the war, calendar reform remained paralyzed. But afterwards it arose again, more determined and daring than ever, though always staying within the bounds of the strictest Christian orthodoxy.

We briefly glance at the movement's subsequent history in the following pages.

IV

REFORM MOVEMENT OF 1928

(This is Chapter XII of Prof. Santillana's book.)

DON CARLOS DE LA PLAZA, in his interesting and learned work, singles out two of the many plans that have been suggested in the last two centuries for the reform of the calendar. These two he considers the most important, as also the most effective in bringing about the desired end

*TRANSLATOR'S NOTE: This article emphasized especially the point that it was not necessary to follow the moon in ascertaining the date of Easter. See biography of Dom Cabrol elsewhere in this issue of the Journal of Calendar Reform.

†TRANSLATOR'S NOTE: A reference to the reform of the Breviary effected in 1911 by the papal bull *Divino Afflato*.

of making Easter and other festivals fall on the same days of the week and the same dates of the year.

One of the plans, which bears the name of *The Moderate Plan*, is content to keep the 12 months that we already have. It has 12 months of 30 or 31 days, four quarters of 91 days, and two half-years of 182 days each. The months of each quarter have 31, 30 and 30 days, in that order: making a total of 364 days. The day left over in ordinary years would be called "Last Day of the Year" (Year Day), and the other one left over in leap years would be called Leap Day. The latter would be placed at the end of the second quarter.

This plan is being advocated throughout the world today by the dominant reform movement.

The second plan singled out by Don Carlos is much more radical. It also has 364 days, disposing of the extra one or two days in the same way as the first plan. But its other elements are so aggressive and audacious as to arouse natural misapprehensions and protests on every side. People fear the upheaval and confusion that would inevitably ensue if this plan were adopted.

The more radical scheme would divide the 364 days of the calendar year into 13 months of 28 days each: four exact weeks. One sees at once that, the number 28 being a multiple of 7, not only all the dates in the year, but all the dates in each month, would fall upon the same days of the week. Thus, e. g., the first, 8th, 15th and 22d of every month would come on Sunday; the second, 9th, 16th and 23d on Tuesday, etc.

At first sight, of course, this division of the civil year into identical months with the same number of days and with the same number of complete weeks would seem to constitute the most logical, the most simple, the most expedient and the least complicated plan that could be devised. All the days, not only of every year, but also of each month, would fall on the same day of the week; and the most illiterate person would know what day of the month and of the year was at hand, or would be at hand, for a given date, without the aid of a calendar: even without any extended mental process. Such a simplification would seem to solve so effectively the hitherto complicated problem of time that the 13-month plan seems in theory to be the most useful and beneficial and ideal and desirable that one could desire.

This radical and daring plan was brought forth and discussed and defended with particular ardor around the year 1928. It became prominent suddenly and it spread rapidly. It aroused great interest, even impassioned support, especially among the intellectual and cultured classes. For one must accept as fundamental the fact that these problems of the calendar are not things to be thought out by the masses, who are not able to understand them, and who brush them aside without further thought. The whole thing must be planned out beforehand and then presented by some competent authority. Even today it is hard to make ordinary people believe that the sun is stationary day after day throughout the year, and that it is we on the earth who are moving hundreds of miles a minute.

The advocates of the 13-month movement were quite capable of organizing it and directing it towards its goal: if they failed, it was owing to something inherent in the plan itself. They quickly gained the sympathy and good will of various governments, which requested different groups and bodies—municipalities, centers of learning and culture, chambers of commerce and the like—to make studies and present memorials about the proposed reform. We in this country who followed the movement with much interest and even with a certain amount of feeling, noted what disagreement it caused among these groups, and how the task of providing the necessary information was left to the few persons familiar with the subject. We here also noted how successful some of these persons were; how, without being real authorities on the subject, either in virtue of studies they had made or works they had published, they created the opinions

and influenced the decisions of very many groups and bodies in the great city where I lived during these years.

But despite all this activity, the project did not meet with success. The movement slowed up, to the sad surprise of those who were dreaming about a swift and complete victory. Of the reasons for this we knew something at the time: but it is only now, when the other plan is more in evidence, that I have come to understand the situation thoroughly and to see clearly the reasons for the failure of the 13-month project. And I think the present is the proper time to set forth those reasons, one after the other. On the one hand, they are historical elements and factors in the general problem of calendar reform; and, on the other, these very reasons and difficulties that caused the 13-month plan to fail are precisely the elements of the question that argue for and support the 12-month project, and make its triumphant success all the more probable.

The difficulties that shipwrecked the reform movement of 1928 were the following:

1. Outweighing the decided advantages of the plan was the inescapable fact that it was too radical. A scheme that demanded an additional month, and a year of 13 months without halves or quarters—taking no cognizance of all the disturbances and changes that would necessarily ensue—went too far. It made no lasting impression on the great mass of the ordinary people.

2. Chambers of Commerce stubbornly defended the citadels of the halves and quarters as the necessary fortresses of the many accounts and statistics that characterize business life.

3. The British Government clearly stated that, whereas the 12-month plan deserved all sympathy and support, the 13-month scheme could never be accepted because it would never satisfy the English people. And it is well known that in matters of this kind the English people almost create the standards of the whole world.

4. Finally, astronomers and statisticians, in sending favorable replies to queries from proponents of the 12-month plan, stated their complete opposition to the 13-month project. If they do not seem at times to give much reason for their very decided stand, one can easily see how, despite the purely solar nature of the year, the science of astronomy cannot divorce itself entirely from the popular traditions and prejudices concerning the moon and the 12 months—or better, concerning the 12 lunations, whose total length is only 10 days less than that of the solar year.

These and like considerations made the downfall of the 13-month plan inevitable. General disillusionment followed. Enthusiasm cooled, expectations died. Those who had looked forward to many advantages and benefits accruing from the plan lost hope. "We shall never see the day of calendar reform," they cried. And yet, as has been said, the very considerations that defeated the previous movement form the best possible foundation for the hope that the current project will meet with complete fulfillment.

V

WORLD CALENDAR PLAN

(This is Chapter XIII of Prof. Santillana's book.)

THE League of Nations, firmly convinced that it had a peculiar duty to examine into the question, turned anew to a consideration of calendar reform and of the growing movement in favor of it that was becoming stronger and stronger. In 1931 the League called together a conference to consider the different plans of reform that were being brought forward. As a result of this conference and the concomitant international discussion, it became evident that the plan which offered the greatest probabilities of immediate adoption was the one that calls for 12 months with four equal quarters, and a fixed Easter. The plan began to be known as The World Calendar, and is the one which is being advocated at the present time.

Nevertheless, the whole movement for calendar reform seemed to remain paralyzed after the activities of the League. And so to me at least the *Progress Report* of the Rational Calendar Association, announcing *orbi et urbi* the fundamental features of the new plan, and the need for speedy and immediate discussion, together with acceptance or rejection in the year 1939, was a pleasant surprise.

The report opens by setting forth the great gains of the movement during the past few months, and mentions in particular the decisive step of June, 1936, whereby the International Labor Conference at Geneva unanimously adopted a motion to approach the League of Nations and recommend the plan of the Rational Calendar Association (World Calendar), as championed by Lord Desborough in the House of Lords.

The report adds the following fact as being of the utmost importance. During a debate in the House of Lords, Lord Feversham, the government spokesman, said that if the League of Nations at Geneva promoted a project for reforming the calendar, the British Government would look upon it with "the most sympathetic and serious consideration"; but he made it plain, at the same time, that the Government "accepted the view expressed in the reports of the Official British Committee of Inquiry (1930) and of the unofficial Parliamentary Committee (1931) that a 13-month calendar would be unacceptable to British public opinion."

The Rational Calendar Association hastened to acclaim the declaration of Lord Feversham, and took account of the principal obstacle in the way of reform by insisting upon the moderation which characterized its plan and upon the title which it bore: "Twelve-Month Equal-Quarter Plan."

This characteristic of *moderate reform* on which the proponents of the plan insist, is of great significance and importance, and shows the reasonable background against which the plan was originally worked out and sponsored. Among the numerous, varied and even opposite schemes of reform that have been proposed and that are discussed right down to the present day, there are some very radical ones which would bring about great changes in our present calendar and our present order of things. And it is precisely this revolutionary character distinctive of certain plans that has aroused mistrust and fear among men of science and among governmental authorities. The bulk of opinion has been for a plan that, without notably changing the existing order of things, would take count of and remedy the defects of our present calendar, introducing only such changes as would be desirable. For in this matter, as in many other things, what is best theoretically, may not always be to the good practically.

It was this general tendency toward conservatism that was taken into consideration when the current plan was formed; and the prudence of the Rational Calendar Association in calling its plan a "moderate reform" enhances probabilities for adoption.

There arises at once a question. How will general public opinion, both of the intellectual classes and of the people in general, receive this new plan, so basically reasonable and prudent, so free from arbitrary arrangements and disturbing changes, so strongly supported by the most authoritative and definite recommendations? One cannot say. Public opinion is a most delicate and timorous thing, especially in problems of this kind.

But one is at once struck by the following notable advantages which the proposed reform would bring in civil and ecclesiastical life:

1. The first advantage is rather speculative than practical. The proposed distribution of the 365 days and of the months, halves and quarters, would put an end to the fortuitous, arbitrary and capricious arrangement we now have, as demonstrated above, and would correspond, if not to strict astronomical calculation, at least to the general concepts of reason, order and usefulness.

2. Since each year and each quarter would begin on Sunday and Easter would be fixed on some definite Sunday, all liturgical feasts, all saints' days, all civil and national holidays would fall each year on the same date of the month and the same day of the

week. In like fashion, any day of the year whatsoever would always recur on the same day of the week. This is something really astonishing and invaluable.

3. It would no longer happen that ecclesiastical and civil feasts coincided in one year and came on separate days in other years, thus making variable the number of work-days in the year. With the new calendar the work-days would always be the same in number for every month, quarter and half. This would be a great advantage for workers and owners alike, and would notably facilitate the keeping of accounts and gathering of statistics, as authorities in these fields have officially acknowledged.

4. A different calendar for every succeeding year would no longer be necessary; and the individual, educated or otherwise, would no longer have to renew his calendar yearly, whether on paper or in his head. This also is an advantage the importance of which can hardly be estimated. By simply ascertaining what day of the week it is, one will be able to say what date of the month it is, and vice versa. The only ones who could possibly protest against this admirable state of affairs would be the large publishing houses: for example, the Offset House of the Nerecán Brothers at San Sebastian, where I myself have seen hundreds of calendars printed for different business concerns at the same time. Commercial houses would simply have to pay their respects to their patrons at the beginning of the year by some other means.

To the point are the following humorous remarks of Don Carlos de la Plaza in his delightful work, *The Perpetual Calendar*. "The industry of calendar-making will be completely revolutionized. In place of the numberless books, booklets and pamphlets which are now published every year, the future will bring us calendars engraved on bronze, silver or gold, and the dates of the month in the perpetual calendar will be encrusted with diamonds, pearls and rubies."

VI

REFORM AND THE CHURCH

(This is Chapter XIV of Prof. Santillana's book.)

BEYOND all doubt, there are not a few Catholic priests who look upon calendar reform with much prejudice, even hostility. I have met plenty such, and they did not hesitate to give expression to their views. The least one can say about these priests is that they are lacking in gratitude. They should reflect more thoroughly upon all the advantages and benefits which they in particular will derive from a reformed calendar for their ministry—for the saying of Mass and the recitation of the Divine Office. One might almost say this reform is a special manifestation of divine Providence to the clergy. The Holy See has stated, in its reply to the Mission to Rome sent by the Rational Calendar Association and headed by Dom Fernand Cabrol, that it viewed the subject of calendar reform as a whole, and that the question of Easter stabilization could not be detached from the question of general reform.* In the light of this, it seems to me, every priest should become an enthusiastic supporter of the reform.

Let me note that this chapter will be completely intelligible only to priests. What, then, will the reform mean for the priesthood?

1. It cannot be denied that the excessive earliness or lateness of Easter brings with it quite a few inconveniences. If the clumsy fluctuation of Easter from March 22 to April 25 is eliminated by the stabilizing of that feast and of all the liturgical feasts dependent upon it, the Church will reap great benefits through the orderly and logical

*TRANSLATOR'S NOTE: Such was the finding of the mission; but the deductions of the mission do not of necessity constitute a statement of the Holy See.

simplification of her liturgy, her cult, her feasts, Lenten devotions, the performance of the Easter Duty, etc.

2. The ideal arrangement would be to celebrate Easter on the historical date of the Resurrection, as is the case with Christmas. A solidly probable opinion places the death of Christ on April 7 in the year 30. Fixing Easter on Sunday, April 8 or 15 of the new calendar, would bring about a closer correspondence between the historical date of the Mystery and its yearly celebration. Besides, there is no doubt that a date in April, when there is apt to be less snow and cold, would be much better for clerical activities in the northern hemisphere: for Lenten services, the solemnities of Holy Week, and the like.

3. The reform would result in a complete and extraordinarily beneficial transformation of the priest's Missal and Breviary, and would bring about the absolute elimination of the classic but annoying division of offices into "Proper of the Time" and "Proper of the Saints." These divisions would no longer exist. Instead, there would be one continuous series of masses and offices, corresponding to the 30 or 31 days of the month; and on each day there would always be one and the same office or mass—either of the liturgical season or of some saint or mystery. There would no longer be "concurrences" of feasts from either "Proper," at least not in the offices of the Universal Church; nor would there be "suppressed" or "simplified" or "translated" offices; and it would not be necessary to accumulate "commemorations" of other simplified or concurring offices. Each day in the Missal and Breviary would have in permanent and continuous form everything referring to the mass and office of that day, and one would not have to turn over numerous pages to consult the mass or office of other days. The *ordo* or annual liturgical calendar would be eliminated. The only *ordo* necessary would be the successive titles of the feast or mass or office for each day of the year in the Breviary or Missal.

4. There is, moreover, another very important question that ought to be considered: the "liturgical movement" that is being agitated everywhere, and is daily receiving new impetus in all countries at the hands of laymen. This movement is causing a marked increase in the number of missals and breviaries that are being published in the vernacular; for there are millions of persons who attend Mass every day and follow the priest in their own missals, and who even read the Divine Office in their own breviaries. This forces them to study closely the liturgical calendar each day; it has led to the publication of *ordos* for the laity, and even to the publication of the masses proper to each successive week.

But all of this can be eliminated in a reformed calendar. The faithful Christian would only have to open his Missal or Breviary at the page containing the mass or office for a given day and he would find there, united into one whole, everything belonging to that mass or office, whether it appertained to a Sunday, a weekday, a saint or a mystery.

All these and similar advantages will be intelligible only to priests; only priests will understand what the reform will mean in their liturgical and ministerial life. Indeed, the many benefits of the reform may seem like a dream, a gilded illusion, a Utopia; yet they will come with absolute certainty if the reform is introduced.

But what will such a reform cost in sacrifices and changes and disturbances?

Nothing. Nothing whatsoever. The reader may see that much for himself. All that must be done is to make the quarters equal, begin them on Sunday, and fix Easter on a definite date.

Then is there nothing that might prevent the reform from being adopted? One of the greatest authorities in these matters, the late Benedictine Abbot of Farnborough, Dom Fernand Cabrol, writes that there is nothing in the discipline, doctrine or liturgy of the Church that is opposed to a new calendar of this kind. The Abbé Chauve-Bertrand, also a great authority, has just published at Paris a book, *La Question de Pâques et du*

Calendrier, which shows, by various reasons and facts, that the attitude of the Church is quite favorable.

Furthermore, much importance and significance must be attached to the statement made by Lord Desborough during the debate on calendar reform in the House of Lords, on March 4, 1936. The statement, as already mentioned, is a summary of the facts ascertained at the Vatican by the Official Mission which was sent to Rome to inform His Holiness, Pius XI and which presented to the Roman authorities a detailed memorial on the subject.

One last question will certainly rise to the lips of my readers: "What prospects has the present plan of reform for being adopted in the year 1939, which is very nearly upon us?"

The reader will find the answer in a summary I am going to make. This will present the facts given in the *Progress Report* of the Rational Calendar Association; and the report itself, as a piece of authoritative information, will be found in its original English form in the appendix.

VII

ENACTMENT IN 1939

(This is Chapter XV of Prof. Santillana's book)

THOUGH the following points have mostly been referred to already, they are gathered together here in one place so that their cumulative force may more easily be seen. One must always remember, of course, the strongest point of all—the intrinsic logic and qualities of the plan itself.*

The current movement for reform has made signal progress in the last few months. The most important step was taken in June, 1936, when the International Labor Conference unanimously adopted a resolution to recommend to the Council of the League of Nations the further consideration of calendar reform. It is quite probable that the League will accept this proposal of the International Labor Conference, and will turn over the matter to the same Committee (Communications and Transit) which presided over the first International Calendar Reform Conference at Geneva. This Committee at its annual meeting in the fall will probably appoint a sub-committee, composed of representatives of the governments, to draw up a full report on the subject and present its findings to the Council of the League at the latter's February meeting of next year.**

An important point in favor of the more moderate plan for reform is the fact that it eliminates the objectionable elements which prevented the adoption of the previous plan.

A number of British industrial organizations have sent to the Government and Church authorities definite assurance that they look upon the proposed plan favorably and will work for its acceptance throughout the country.

In April, 1936, the Council of the London Chamber of Commerce unanimously

*TRANSLATOR'S NOTE: In what follows, the original language of the "Progress Report" is used wherever Father Santillana is evidently translating directly from the English.

**As a matter of fact, since Father Santillana wrote, the text of an international treaty on calendar reform has been submitted to all governments by the League of Nations. The form of revision advocated is The World Calendar.

adopted a resolution urging the British Government to use all its influence at Geneva in order to secure the adoption of the 12-month equal-quarter plan as proposed by Lord Desborough. And at the beginning of May the Association of British Chambers of Commerce passed the same resolution at its annual meeting.

On March 4, 1936, there took place in the British House of Lords a debate upon the motion of Lord Merthyr that calendar reform should be adopted by international action. In the course of the debate the Archbishop of Canterbury, speaking for the Church of England, went on record as being in favor of general reform. And at the end of the debate, the Government spokesman, Lord Feversham, promised that if the matter were raised by the League of Nations at Geneva, it would have "the most sympathetic and serious consideration" of the British Government.

In the same debate, Lord Desborough referred at length to a Mission of Inquiry which was organized in the first few months of 1936, went to Rome to inquire into the attitude of the Vatican, and presented to the authorities a Latin memento on the subject.

The Abbot of Farnborough, Dom Fernand Cabrol, and the Abbé Chauve-Bertrand, two outstanding ecclesiastical authorities on the subject of the calendar, have definitely stated that there is nothing in the liturgy or doctrine of the Church that would be adverse to calendar reform, and that, on the contrary, the reform would offer many advantages to Catholic life, and particularly to the Catholic clergy.

One of the most telling doubts about calendar reform has always been whether astronomers and statisticians are in favor of it or against it; for it was these classes of experts especially that brought about the downfall of previous plans. Hence the importance of the following. The International Astronomical Union has on more than one occasion shown itself favorable to a 12-month reform; and this very year the Astronomer Royal of Great Britain, Dr. Spencer Jones, expressed himself as being in favor of this reform.

As regards statistical opinion, a special Committee was appointed during 1935 by the Royal Statistical Society to report on the proposals for reform. This Committee, which was presided over by Dr. Isserlis of the Chamber of Shipping and included statistical experts from the Board of Trade, the Meteorological Office and various industrial organizations, found that "the existing calendar presents real difficulties in statistical work" and that a fixed calendar year was desirable. Their report stated that the prime importance of quarterly statistics "appears to rule out completely the proposed year of 13 months."

The press brings us many dispatches about the speed with which the movement for calendar reform is growing and spreading in North America. I have before me a lengthy and authoritative article by Professor Harlan T. Stetson of Harvard University dealing convincingly with this aspect of the subject.

These pages have been written with the sole aim of helping to create correct opinions about calendar reform. I will now leave the reader to form his own impartial conclusions on the question of the 12-month equal-quarter plan: on the arguments that support it, the advantages it offers and the chances it has of being adopted. If he finds himself convinced of the intrinsic merits and many advantages of the plan, may he become a sincere and enthusiastic supporter of it! For in this, as in few other problems of human life, success or failure depends on public opinion; and public opinion is not to be created by any other means than the ardent convictions and infectious energy of individuals.

To make a small personal contribution to the creation of this public opinion has therefore been my sole purpose in writing these pages—pages which, as I promised in the beginning, have been short, concise, sincere and hopeful.

STREAMLINE THE CALENDAR

By MRS. ROWLAND HILL LATHAM

Representative of the General Federation of Women's Clubs on Calendar Reform

(From the *Clubwoman*, November, 1937)

At the Tulsa Council meeting the Executive Committee of the General Federation was requested to name one of its members to investigate the subject of World Calendar Reform. Mrs. Latham, who was then representing the Directors on that Committee, was named to the post. She has since made an intensive study of the matter and is now asking that all clubs study the subject with a view to the submission of the subject for action at the Kansas City Triennial next May.

CLUB women have been making a special study of the movement to reform the calendar. There now arises the question whether, following this study we should do our part in furthering this reform. I may sum up the reasons for answering this question in the affirmative.

The calendar is the oldest achievement of civilization. It is the heritage of the human race, women as well as men, and women, like men, make full use of the calendar. On any proposal affecting the calendar they are entitled to be heard and to make their influence felt.

Within living memory, an intolerable confusion of clocks and watches throughout the world was brought to an end by the adoption of standard time arranged according to zones covering land and sea. There are postal agreements between nations, extending even to uniform details like colors of stamps of a given value, without which correspondence across frontiers would be extremely difficult. So is it with the Gregorian Calendar. It is no longer the calendar of Europe and America alone. Its use has become almost universal. Intercommunication between countries and individuals would be complicated without the use of this calendar.

An instrument of civilization that is of necessity to mankind as a whole ought to be the best that mankind can devise. Notwithstanding its increasing value, due to extending use, the Gregorian Calendar contains serious imperfections which clearly should be eliminated. Reform of the Calendar has been under the serious consideration of the League of Nations, of individual governments, of religious communions, education, industries and other organizations. Despite the usual difficulty of securing international consent for any improvement in human relations, interest in calendar reform is growing.

Of many proposals, one holds the field. It is known as The World Calendar and the President of The World Calendar Association is a woman, Miss Elisabeth Achelis. The World Calendar embodies simple adjustments whereby it is possible, once for all, to establish the Calendar on a logical

and permanent basis. The World Calendar secures the following results:

(1) A year of twelve months that shall be uniform with each day of every month, including holidays and anniversaries, falling on its appointed weekday. For instance, New Year's Day would always be a Sunday, the first day of the week, and Christmas would always be a Monday.

(2) Four equal and uniform quarters in the year, each of 91 days or 13 exact weeks, each beginning on a Sunday and ending on a Saturday, and each containing three months respectively of 31, 30 and 30 days.

(3) An international holiday conveniently called Year-End Day (the 365th day) lying between December 30 and January 1 on an extra Saturday, with an additional holiday in Leap Years (the 366th day) set between June 30 and July 1 on another extra Saturday.

This is what is meant by The World Calendar, and all that is meant. The proposed change in the Gregorian Calendar—not a great or a disturbing change—ends the drift of successive years over the various days of the week. It equalizes quarters and half years, at present unequal. It regularizes the months and ends the anomaly of a February with only 28 days. The statistical, financial and social advantages arising out of these simplifications are obvious and far-reaching.

We have to draw a clear distinction in our minds. First, there is The World Calendar itself in its simple fundamentals—what may be described as the best mathematical arrangement of the solar year of 365 and a fractional days. Secondly, there are the various uses that may be made of The World Calendar when it is adopted, always assuming that these uses are approved by any country or community affected by them. The proposal for a World Calendar is one thing—it stands alone and can be adopted for its own sake. The applications of the proposal are another thing and can be adopted or rejected without prejudice to the proposal itself.

The optional simplifications facilitated by The World Calendar may be briefly indicated. These simplifications are religious and civil.

First, there is the proposal to fix the date of Easter, on April 8 or the second Sunday in April. This would remedy the agelong oscillation of Easter and the movable feasts that depend on Easter over a period of no less than 35 days. A fixed Easter has been legalized by the British Parliament, but on condition that it be approved by the churches before it becomes operative. Easter stabilization, extremely desirable, belongs in the realm of the churches for final decision whereas calendar reform lies in the domain of governments for adoption.

Secondly, there are national holidays in every country that drift, hither and thither, over the days of the week, often clashing with Saturday or Sunday. The World Calendar enables a country, if it wishes, to arrange its holidays according to a definite and perpetual schedule.

Let us see how this might be of service to the United States. By gen-

eral admission, a great boon to all who earn a living is the long week-end. This boon is assured by The World Calendar automatically in the case of Year-End Day, Leap-Year Day, Christmas and Labor Day. It is suggested that other long week-ends could be associated with Memorial Day, Columbus Day, Election Day, Armistice Day and Thanksgiving. Washington was born under the Old Style of Julian Calendar. The actual date of his birthday is not February 22 but February 11, a Saturday which, with Lincoln's Birthday falling on February 12, a Sunday, and the following Monday might provide for another long week-end.

On the merits of The World Calendar and the results that might follow from its adoption, there is an increasing measure of agreement. A convenient year for adopting the calendar would be 1939 for in that year January 1st falls on a Sunday as in The World Calendar. There is, however, little difficulty in adopting The World Calendar on any day in the Gregorian year which happens to synchronize with a day in The World Calendar.

The whole of mankind has never yet adopted a reform of the calendar all at once. Our present Gregorian Calendar was only accepted by nations successively and a number of nations—for instance, Russia, China and Japan—delayed adoption until a comparatively recent date. In the case of The World Calendar certain nations have approved the reform and should thus be in a position to lead the way. If we are to judge by the experience of the past, other nations may be expected to follow. Is it unreasonable to suggest that the United States be among the progressive countries? It is unlikely that calendrical discrepancies between nations who have or have not adopted The World Calendar, even if such temporary discrepancies were to arise, would last for more than a brief transitional period.

The movement for a World Calendar has an importance beyond the calendar itself. It is one among instances of a healing cooperation in an era of disastrous conflict. Many of us are disturbed in our minds over animosities between nations, races, religions and cultural ideologies. The world needs an international sense—a commonsense—that will lessen these dangerous emotions. This commonsense within the commonwealth of mankind can only overcome enmities if it be constructive. Attention should be diverted from rivalries to mutual effort and cooperation, however simple is the objective in view, and the movement in favor of The World Calendar is drawing together leaders in church and state, who may differ from one another over many other affairs of life. A calendar that is convenient for all to use makes for reconciliation.

FROM A SWEDISH VIEWPOINT

By E. B. TRANEUS

(Translation by Iris Wennstrom)

SWEDEN, it seems to me, has been somewhat laggard in taking up this question of calendar reform, which is being pushed so intensively in many European countries and throughout the Americas, North and South. Sweden's failure to be in the forefront of the movement is the more surprising because as a nation, it happens to be free from almost all the political, economic and international difficulties which are facing other countries, and therefore is able to do important work on this subject.

It is possible, of course, that the inner circles of our government have done something which has not reached the public. But if that should be the case, it only proves that the work has not been done in the right way.

Calendar reform is not a question to be decided abstractly; it is not a question solely of scientific-astronomical purport. Rather it is a matter which concerns the whole people; it affects each and every one of us, personally and intimately. A revision of the calendar, therefore, should be discussed publicly, and definite effort should be made to win and hold public support and opinion. Otherwise the rank and file of the people will not be ready for it when the time comes for a decision; they will be wondering and hesitant when they are asked to support it. The Swedish government must therefore adopt the same policy as other nations where this question has received almost incredible publicity.

Once the proposal is thrown open for public discussion in Sweden, with official backing, plenty of suitable ways and means for the promotion of the idea will be found available. The newspaper and periodical press will deal with it editorially, Parliament will debate it, speakers and organizations will take it up. Whether or not a supporting initiative comes from the government, the public may well be asked to inform itself on so important a matter. Comment should be sought from commercial, industrial and economic groups, in exactly the way which has proved so effective in England, Germany, France and America.

If The World Calendar is to be adopted in 1939 it is high time that Sweden do something about it before the end of 1937. A series of articles which I am publishing in the Swedish press is designed to awaken public interest in the proposed revision of the calendar. I think some definite results will follow.

I have been asked, in my public and private discussions of this question, why the world—especially in these troubled days—is suddenly taking such an interest in the reform of a calendar which seems to have served us well for many centuries. The answer is easily found: the world-wide

improvement of communications and the speeding up of international business have brought nations and peoples much more closely together than in the past, and have made it desirable and indeed necessary to have a system of time-measurement that is uniform and efficient in the broadest possible degree. Increased accuracy in calculations and statistics demands a more exact calendar than the antiquated system of the past.

The calendar indeed must reflect the times, not only from a scientific viewpoint but also from a social and economic one. With the enormous improvements which have taken place in every field of science, industry and economics, it would be strange indeed if a reasonable demand did not arise for a less primitive calendar than the one we have.

Many otherwise well-informed people are surprisingly ignorant in the matter of the calendar. They have no idea, for instance, of the diversity of calendars in use at the present time throughout the world. Gregorian, Julian, Jewish, Mohammedan, Indian, Chinese—these are examples whose use is enormously widespread. I happen to have before me, as I write, a copy of a magazine which circulates mainly in the Near East and India. Because its readers come from many racial groups, the magazine has to be dated according to no less than six different calendars—the Gregorian, Julian, Jewish, Mohammedan, Coptic and Iranian.

The first country to take up direct measures for a reform of the calendar was Switzerland which thus followed its tradition of working for international cooperation. The Swiss official proposals were initiated in 1913, but the World War disrupted plans for carrying them forward. After the war, however, the Swiss Government persuaded the League of Nations to take up the movement, and the League's offices in Geneva have been the center of the movement since 1923. After ten years of investigation and promotion, the League has submitted to all nations a draft treaty for the enactment of the reform.

Switzerland meanwhile has carried out an intensive investigation regarding the changes which the introduction of a new calendar would necessitate in the constitution, in civil law and in banking and insurance laws. Switzerland has thus—as often before—proved itself to be a pioneer.

England, however, is the pioneer country in the campaign for a stabilized Easter. The British Parliament has actually passed a bill for a stabilized Easter, and the law may be made effective at any time, under its enacting clause, when other countries are ready to fall in line.

On the question of general calendar reform, the British Government has officially stated that it is favorably disposed and ready to participate in any international arrangement for enactment.

The attitude of France, Germany, Italy and other nations is similar to that of England. In other words, international support is not lacking for adoption of a revised calendar. North and South American nations,

without exception, are favorable, and so are Japan and China, in Asia.

Every country and every race have a somewhat different angle of approach to its study of the calendar. In Egypt 6000 years ago, the inhabitants of the Nile valley had a natural basis for reckoning time in the regularly recurring floods of the great river upon which their agricultural and cultural life was absolutely dependent. In ancient Chaldea and Babylonia, the celestial bodies were worshipped as gods, and the priest-astronomers therefore based their calendars upon the moon's journey around the earth. The old Greek city-states were so jealously independent that each one had its separate calendar, thus creating a universal confusion that centuries of modern research have been unable to disentangle. North American Indians kept their calendar with bundles of sticks.

The 7-day week came into use in the Near East about 1800 B.C., but was not adopted by the Western World until many centuries after the Julian calendar had risen to world ascendency. Modern nations call the week days by a great variety of names. Sunday is named by the Germanic nations after the Sun, but the Latin languages call it Lord's Day. Monday is almost universally called after the moon. Tuesday gets its name from the Nordic god Tyr, counterpart of the Roman war god, Mars. Wednesday is named after Odin, but Southern Europe names it from Mercury. Thursday stems back to Thor or Jupiter, Friday to Froja or Venus. Saturday comes from Saturn, but Swedes call it "lög-dag" or wash day.

Nations have only recently begun to agree on a date for the year's beginning. Ancient Romans began the year on March 1, Egyptians on July 19, Greeks on July 1, Medieval Europeans on March 21 or December 25. The Chinese New Year wanders, like our Easter.

Today's movement for calendar reform is a powerful influence for international peace. In the past, calendrical differences between peoples and races have repeatedly led to riots and even wars. Christendom was agitated for many centuries over the Easter date controversies. Pope Gregory's scientific revision of the calendar caused schisms which are not yet completely healed. Chinese emperors beheaded astronomers for calendrical inaccuracies; London cockneys rioted in 1752 in an effort to make the government give them back their eleven days; Turkey and other Mohammedan countries feared to abandon the moon-year until a very recent date; Russia vainly sought to emphasize and confirm the Bolshevik revolution with revolutionary calendars of various types.

In seeking to make the calendar universal and perpetual we are thus reconciling and bringing together age-old differences of reckoning, thought and nomenclature. It is a tendency which has already gone far on the path toward realization, and The World Calendar is another step—an important one—in this progress.

ADJUSTMENTS IN STATISTICS

By G. S. WRONG

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WORK of all statisticians is affected by the nature of the units used; and one of the most important units in statistics is one of time. Statistics of population, areas of land under cultivation, available water power, forest and mine resources, etc., must be related to specific dates, but the great bulk of all statistics is related to periods of time. The number of births, deaths and marriages, the number of immigrants and emigrants, the bushels of grain harvested, the tons of coal mined and consumed, the value of imports and exports, wages paid, production of pulp and paper, of automobiles, and the hundreds of other records of production, consumption, transportation and so forth, must be measured by time. Also the records must be related to past records or to records of other countries. A bald statement that Canada produced 200,000 motor vehicles means nothing unless the time is stated and even then means little without records of production for other periods of time of the same magnitude or the production of other countries during the same period. The chief value of such records is to indicate trends or velocities of progress and, consequently, factors which affect the trends must be measured for equal units of time.

The units of time most commonly used in statistics are the year and the month. One year is approximately the same as another as a unit of time; even leap year with its extra day affects comparisons less than 1/3 of one per cent because of the extra day. But the month is a very unsatisfactory unit of time. No two consecutive months are the same and corresponding months in consecutive years are not the same.

Everyone recognizes that records of periods of 28 days, 30 days and 31 days cannot be compared to establish rates of progress or trends without some correction. It is just as important, however, to have the same number of days of the same production value in each period of time and in this respect each month but February changes each year for a span of five years.

The days of the week have different values due to the more or less fixed customs of the people. Of course, in countries where the customs differ, the values of the days differ, and the values differ in different industries, in different parts of the country and at different times of the year. Some examples will illustrate this phase of the problem more clearly than abstract discussion. It is the custom in Canada to cease industrial activities on Sunday, and many industries work only half a day on Saturdays. Also, when a holiday occurs on Friday, many industrial plants do not operate on Saturday. It is quite obvious that a month containing five Sundays and five Saturdays will have a different record from the same month of the previous

year when there were only four Sundays and four Saturdays if the rate of production or consumption, or whatever it may be, remained the same. Consequently a direct comparison of records of corresponding months in consecutive years might indicate only a change in the time and not in the rate. A large power company in Canada produced 220 million kilowatt hours in January, 1936, and 258 million kilowatt hours in January, 1937, indicating an increase of 17.3 per cent in the total production or in the average daily production. On Sundays and Saturdays, however, its plants produce only 30 per cent and 75 per cent, respectively, of the output of other weekdays, and if allowance were made for the extra Sunday and Saturday in January, 1937, the rate of increase becomes 21.5 per cent instead of 17.3 per cent!

In analysing the retail trade of Canada the Bureau realized that direct comparisons of the dollar value of retail sales for corresponding months in consecutive years and for consecutive months in the same year were invalid for the purpose of ascertaining the underlying trends in retail business because of the unequal number of weekdays in the months and the unequal sales importance of the different days of the week. The retail trade also recognized this and to overcome the difficulty a considerable number of the larger stores have discarded the calendar month as an accounting and statistical unit and have adopted a four-week period or a combination of two four-week periods and one five-week period. This latter closely corresponds to a three-month calendar period and thus makes possible comparisons with previous calendar month records. Comparisons of statistics for four and five-week periods are not complicated by the unequal number of days of different sales values.

The Bureau collects retail sales statistics from 36 department stores and 170 chain store companies operating in 12 different lines of business and because 35 of these stores used the four or five-week accounting period the Bureau was forced to adjust the statistics for these four and five-week periods to calendar month bases; not because the calendar month was the preferable unit but because practically all other statistics were on the calendar month basis. To do this it was necessary to compute the average sales value of each day of the week. Fortunately sufficient data was available to compute these fairly satisfactorily, but at best they were averages.

The adjustments, however, became so complicated that the Bureau requested the large stores which had adopted the four-week periods to report sales on the calendar month basis.

The sales values for the days of the week were used to compute correction factors for each month for each year for each of the twelve classes of retail stores and although the factors are not accurate, it was considered that the index numbers of retail business thus adjusted revealed much better the trends than direct comparisons of sales with no correction.

Table 1 shows the sales values for each day of the week for the different kinds of business and Table 3 shows the factors used to correct the months for the unequal number of business days and the unequal value of the different days of the week.

TABLE 1.—PERCENTAGE OF WEEKLY BUSINESS TRANSACTED ON DIFFERENT DAYS OF THE WEEK IN STORES CLASSIFIED ACCORDING TO KIND OF BUSINESS, CANADA, 1935

Kind of Business	TOTAL	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Department stores.....	100.0	...	15.0	15.0	15.0	16.7	16.7	21.6
Variety stores.....	100.0	...	11.7	11.7	11.7	13.3	13.3	38.3
Men's clothing stores.....	100.0	...	10.0	11.7	13.3	13.3	16.7	35.0
Women's clothing stores.....	100.0	...	10.0	11.7	13.3	13.3	16.7	35.0
Boot and shoe stores.....	100.0	...	13.3	10.0	11.7	13.3	13.3	38.4
Candy and confectionery stores.....	100.0	...	11.7	11.7	13.3	13.3	15.0	35.0
Furniture stores.....	100.0	...	15.0	15.0	15.0	15.0	15.0	25.0
Grocery and meat stores.....	100.0	...	8.3	10.0	11.7	13.3	16.7	40.0
Drug stores.....	100.0	5.7	11.4	14.3	14.3	14.3	15.7	24.3
Restaurants.....	100.0	8.6	14.3	14.3	14.3	14.3	15.7	18.5

The Bureau's index numbers of retail sales are split into three series, "A" unadjusted, that is the data are used as reported, "B" corrected for the number of business days in each month and the sales values of each day, and "C" the same as "B" but further corrected for seasonal variations. Table 2 shows the effect of these corrections on the index numbers.

The adjustment for the business days and sales values of each day raised the index number for grocery and meat stores for March, 1937, from 82.6 to 84.8, or 2.7 per cent, but in January when there were five Saturdays and five Fridays, heavy sales days, the effect was the reverse, the index number being reduced from 79.8 to 77.0, or 3.1 per cent. Thus the unequal number of heavy sales days causes a fluctuation in comparison with the unadjusted index number from a plus of 2.7 per cent to a minus of 3.1 per cent, or a spread of 5.8 points.

A comparison of sales in these stores for October, 1936 and 1935, would show an increase of 8 per cent, because of five Thursdays, Fridays and Saturdays, as against four Fridays and Saturdays and five Tuesdays, Wednesdays and Thursdays in October, 1935. Business next July will show an increase of 6½ per cent over July last year due only to the differences in the month. Other factors will further increase the ratio or lower it but the effect of the unequal number of days with different sales value will always be there with the present calendar month used as a unit of time.

Although a correction for all these inequalities in the months is not made in production and consumption data in other fields, the methods used in computing index numbers for these monthly data make some adjustment for the unequal number of days.

The only feasible way of correcting this state of affairs is to correct the accounting period used as a unit of measurement and statisticians, accountants, managers and all other persons using records of production, etc., would most assuredly welcome a revision of the present calendar which will provide an accounting period of fixed length or which will at least make each month identical with the corresponding month of the previous years.

TABLE 2—INDEX NUMBERS OF RETAIL SALES. MARCH 1937.
(Average for 1930 equals 100)

Kind of Business	"A"	"B"	"C"
Department stores.....	70.7	70.3	72.5
Variety stores.....	79.6	80.4	96.9
Men's clothing.....	70.0	71.7	71.7
Women's clothing.....	59.3	60.1	65.3
Boots and shoes.....	63.3	63.8	72.5
Candy and confectionery.....	85.2	84.6	65.1
Furniture.....	79.8	78.6	90.4
Grocery and meat.....	82.6	84.8	84.8
Drug stores.....	82.3	81.1	80.3
Restaurants.....	57.0	56.0	57.7
Radio and music.....	47.0	46.4	56.6
Hardware.....	65.5		
Dyers and cleaners.....	67.7	66.9	66.9

TABLE 3—NUMBER OF BUSINESS DAYS (WEIGHTED) BY MONTHS, 1931-1935,
BY KINDS OF BUSINESS

Year and Month	A	B	C	D	E	F	G	H	I	J
1931										
January.....	26.3	27.1	27.1	27.1	27.8	26.4	27.4	31.8	31.4	26
February.....	24.0	24.0	24.0	24.0	24.0	24.0	24.0	28.0	28.0	24
March.....	25.8	25.4	25.3	25.4	25.4	25.8	25.1	30.2	30.6	26
April.....	24.9	24.7	24.6	24.7	25.6	24.9	24.5	30.0	30.0	25
May.....	25.4	26.4	26.5	26.3	27.0	25.5	26.9	31.2	31.0	25
June.....	26.8	25.4	25.3	25.4	25.4	25.8	25.1	29.8	30.0	26
July.....	26.0	25.6	25.8	25.6	26.5	25.8	25.8	31.1	31.1	26
August.....	26.2	27.0	26.7	27.1	28.8	26.4	26.9	30.9	30.9	26
September.....	24.9	24.7	24.9	24.5	25.5	24.9	24.8	30.0	30.0	25
October.....	27.3	27.9	27.9	27.8	27.3	28.2	31.8	31.4	31.4	27
November.....	24.9	24.7	24.6	24.8	24.7	24.9	24.5	29.2	29.6	25
December.....	25.8	25.4	25.3	25.3	26.3	25.8	25.1	31.0	31.0	26
1932										
January.....	25.3	26.3	26.1	26.3	27.0	25.5	26.4	31.2	31.0	25
February.....	24.9	24.7	24.6	24.8	24.7	24.9	24.5	28.8	29.0	25
March.....	25.8	25.4	25.3	25.3	26.3	25.8	25.1	31.0	31.0	26
April.....	26.3	27.1	27.1	27.1	27.0	26.4	27.4	30.8	30.4	26
May.....	24.9	24.7	24.6	24.8	25.4	24.9	24.5	30.2	30.6	25
June.....	25.9	25.5	25.6	25.5	25.6	25.8	25.5	30.0	30.0	26
July.....	25.3	26.3	26.1	26.3	27.0	25.5	26.4	31.2	31.0	25
August.....	26.7	26.1	26.1	26.1	26.2	26.7	25.8	30.8	31.0	27
September.....	25.1	24.9	25.2	24.8	25.7	24.9	25.3	30.1	30.1	25
October.....	26.2	27.0	26.7	27.1	26.8	26.4	26.9	30.9	30.9	28
November.....	25.8	25.4	25.5	25.3	25.5	25.8	25.3	30.0	30.0	26
December.....	26.4	27.2	27.3	27.1	27.8	26.4	27.7	31.8	31.4	26
1933										
January.....	24.9	24.7	24.7	24.6	25.4	24.9	24.6	30.2	30.6	25
February.....	24.0	24.0	24.0	24.0	24.0	24.0	24.0	28.0	28.0	24
March.....	26.9	26.3	26.6	26.3	26.5	26.7	26.5	31.1	31.1	27
April.....	24.3	25.5	25.1	25.5	26.1	24.6	25.4	30.1	29.9	24
May.....	25.8	25.4	25.3	25.4	26.2	25.8	25.1	30.8	31.0	26
June.....	26.0	25.6	25.8	25.6	25.7	25.8	25.8	30.1	30.1	26
July.....	24.9	24.7	24.6	24.8	26.8	24.9	24.5	30.9	30.9	25
August.....	26.8	26.2	26.3	26.1	26.3	26.7	26.1	31.0	31.0	27
September.....	25.4	26.4	26.5	26.3	27.0	25.5	26.9	30.8	30.4	25
October.....	25.8	25.4	25.3	25.4	25.4	25.8	25.1	30.2	30.6	26
November.....	25.9	25.5	25.6	25.5	25.6	25.8	25.5	30.0	30.0	26
December.....	25.4	26.4	26.5	26.3	27.0	25.5	26.9	31.2	31.0	25
1934										
January.....	25.8	25.4	25.5	25.3	26.2	25.8	25.3	30.8	31.0	26
February.....	24.0	24.0	24.0	24.0	24.0	24.0	24.0	28.0	28.0	24
March.....	26.3	27.1	26.9	27.1	27.8	26.4	27.2	31.8	31.4	26
April.....	24.9	24.7	24.6	24.8	24.7	24.9	24.5	29.2	29.6	25
May.....	25.8	25.4	25.5	25.3	26.3	25.8	25.3	31.0	31.0	26
June.....	26.3	27.1	27.1	27.1	27.0	26.4	27.4	30.8	30.4	26
July.....	24.9	24.7	24.7	24.6	25.4	24.9	24.6	30.2	30.6	25
August.....	26.9	26.3	26.6	26.3	26.5	26.7	26.5	31.1	31.1	27
September.....	24.4	25.6	25.5	25.5	26.1	24.6	25.9	30.1	29.9	24
October.....	26.7	26.1	26.1	26.1	26.2	26.7	25.8	30.8	31.0	27
November.....	26.0	25.6	25.8	25.6	25.7	25.8	25.8	30.1	30.1	26
December.....	25.3	26.3	26.0	26.5	26.8	25.5	26.3	30.9	30.9	25
1935										
January.....	25.9	25.5	25.6	25.5	26.3	25.8	25.5	31.0	31.0	26
February.....	24.0	24.0	24.0	24.0	24.0	24.0	24.0	28.0	28.0	24
March.....	26.3	27.1	27.1	27.1	27.0	26.4	27.4	31.2	31.0	26
April.....	24.8	24.6	24.3	24.6	25.4	24.9	24.1	29.8	30.0	25
May.....	25.9	25.5	25.6	25.5	26.5	25.8	25.5	31.1	31.1	26
June.....	25.3	26.3	26.1	26.3	26.1	25.5	26.4	30.1	29.9	25
July.....	25.8	25.4	25.5	25.3	26.2	25.8	25.3	30.8	31.0	26
August.....	27.3	27.9	27.9	27.9	27.8	27.3	28.2	31.8	31.4	27
September.....	24.0	24.0	24.0	24.0	24.7	24.0	24.0	29.2	29.6	24
October.....	26.8	26.2	26.3	26.1	26.3	26.7	26.1	31.0	31.0	27
November.....	26.3	27.1	27.1	27.1	27.0	26.5	27.4	30.8	30.4	26
December.....	24.9	24.7	24.5	24.7	25.4	24.8	24.4	30.2	30.6	25

A. Department Stores.

B. Variety Stores.

C. Men's and Women's Clothing Stores.

D. Boot and Shoe Stores.

E. Candy and Confectionery.

F. Furniture Stores.

G. Grocery and Meat Stores.

H. Drug Stores.

I. Restaurants.

J. Radio and Music, Hardware, and Dyers and Cleaners.

TIME THROUGH THE AGES

By ARTHUR M. HARDING

Professor of Mathematics, University of Arkansas

This is the third of a series of articles on the scientific backgrounds of man's system of measuring time. The writer is a distinguished member of the American Mathematical Society, the American Astronomical Society and the American Association for the Advancement of Science. He is the author of the most popular text book on astronomy which has been published in many years.

THOSE who regard the movement for calendar reform as a novelty—as something almost shockingly new—are merely betraying their ignorance of what has been going on in the world for the past 10,000 years or so. Man's efforts at time-keeping have been many and varied, and his calendars down through the ages have been myriad in their number.

Much of the confusion that exists with reference to some of the early dates of history is due to the fact that some nations chose to regulate their calendars by the sun, others by the moon, and still others by the stars. How can we be sure of the exact date of any event recorded in pre-historic times unless we know whether the historian recorded his time in months or in years?

Those who lived by the moon and measured their time in lunar months could keep a very accurate record of events, for the exact length of a lunation could be easily determined. But in the early days, just as in the twentieth century, the recurring seasons made their impression upon all vegetable and animal life, so that man was forced to recognize the solar year even though he preferred to keep his time-records in lunar units, and confusion resulted from his attempts to determine exactly when the year began and when it ended. The development of the calendar from very earliest times is of great interest, for a number of different devices have been employed for keeping tab on Father Time.

Just west of the brilliant Orion in the constellation Taurus—the Bull—is a little group of stars called the Pleiades which may be easily identified. The Pleiades lie in a region of the sky which was at one time of much greater importance than it is today. About 4000 years ago the Vernal Equinox—the point occupied by the sun on March 21—was very close to the Pleiades so that in those days the Bull, and not the Ram, was the first constellation of the Zodiac.

Proof has recently been found of the fact that the Persians and the Chinese began their Zodiac with the Bull and it is said that a burial chamber has been excavated in Egypt showing a list of constellations of the Zodiac with the Bull at the head of them. In the astrological books of the

Jews the Bull is considered as the first Zodiacal sign, and the classical poets tell us that bulls were frequently sacrificed to Jupiter and that the priests performed these ceremonies in the disguise of a bull-headed monster. Does not Virgil say, "the Bull with his golden horns opened the year"?

Because of the precession of the equinoxes, which makes it necessary for us to distinguish between signs and constellations of the Zodiac the Vernal Equinox has slowly retrograded since that time, first through the constellation of the Bull and then through the Ram, and is now to be found in the constellation of the Fishes. But 4000 years ago the Bull was the leading sign and the Pleiades were extremely close to what was probably the most important point in the sky.

About 4000 years ago, when the Bull was the first constellation of the Zodiac, the Chaldeans made very accurate measurements of time. Our information about their calendar and their astronomical observations has been obtained from an ancient work called "The Observations of Bel," supposed to date from about 1700 B.C. This work consists of 70 books written on small earthen tablets. The results of the observations of the Chaldeans must have been known to later peoples for the celebrated astronomer, Ptolemy, made use of three eclipses which were observed in Babylon in 721 B.C. and 720 B.C.

Not only did the Pleiades mark the spot in the sky that would be occupied by the sun at the beginning of spring, but this group of stars was actually used to regulate the earliest calendars of which we have any record. Everyone can identify the Pleiades, and when they are on the meridian at midnight about the first of November we are fond of telling the story about how the date of our own Hallowe'en is fixed by the Pleiades, but very few of us realize that far back in the dawn of history primitive peoples depended upon the Pleiades to notify them of the beginning of a new year.

Like all the other stars, the Pleiades steadily drift toward the west, rising about four minutes earlier every night. Consequently, if this star-group is just above the eastern horizon tonight at sunset, we will find it higher and higher in the sky on each succeeding evening and, after about three months, its seven dim stars will be seen near the meridian after the sun has disappeared. During the next three months the Pleiades will continue to drift westward, appearing lower and lower in the western sky every evening until they are finally lost in the rays of the setting sun.

This compact group of stars, which was visible at sunset during one-half of the year and invisible during the other half, naturally attracted the attention of primitive man and measured time for him. In this calendar the year was not broken up into 12 months as we have it today but was merely divided into two parts, depending upon whether the Pleiades were visible or invisible at sunset. Since these stars are rising at sunset in the month we now call November the year began at that time. That part of the year from November to April, during which the Pleiades were visible at sunset, was called Pleiades Above and the other part of the year from April to November, when the Pleiades were not visible at sunset, was called Pleiades Below.

It is said that this type of calendar exists today among certain savage races. At any rate, our three-day festival, which begins with Hallowe'en and includes All Saint's Day and All Soul's Day, may be traced back to the very beginning of history where it was observed as a New Year's festival. It should be noticed that the Pleiades Calendar is entirely independent of the moon, the length of the year being determined solely by the position of this well-known group of stars at sunset.

Modern people live indoors with artificial lights and very few of us ever see the

moon, but when the human race was in its infancy man lived out of doors with no light at night except the moon, whose phases must have attracted his attention as they recurred at regular intervals. The Chaldeans, the Babylonians, and later the Hebrews, regulated their calendars by the moon and paid no attention to the sun. Every appearance of the new moon marked a new "moonth," or month.

We live by the sun and could get along very well with no moon at all, but this is only because the Egyptians, from whom we got our calendar, were sun-worshippers. A lunar calendar might be just as satisfactory to us as a solar calendar if we had started that way. The sun erases all of the stars from the sky so that its position among them may be determined only indirectly. On the other hand, the moon may be very clearly seen against the starry background of the sky and lunar calendars can be regulated with great accuracy.

Let us examine in some detail the Hebrew Calendar which is used by many people today. All Hebrew festivals were regulated by the moon, the months beginning at the first appearance of the new moon in the evening twilight. Does not the poet tell us (Psalms 104, 19) "God appointed the moon for seasons"? The Jews evidently had some method of knowing in advance the date of new moon for in the twentieth chapter of First Samuel, David said to Jonathan, "Behold, it is new moon tomorrow and I shall not fail to sit at meat with the king."

We must not assume that the early Hebrews knew nothing about the solar year of 365 days merely because they did not choose to use it. If one will first make a study of the Hebrew Calendar and then read the Biblical description of the Flood of Noah he can not help but be impressed by the fact that the flood began on New Year's Day and lasted exactly one solar year of 365 days.

The Biblical writer is thinking in terms of lunations and not of solar years and so he tells us that the flood began on the seventeenth day of the second month and ended on the twenty-seventh day of the second month of the following year. In other words, the water was over the face of the earth for twelve lunations and eleven days which is exactly 365 days. But the seventeenth day of the second Hebrew month was New Year's Day among those primitive peoples who regulated their calendar by the Pleiades, so the flood actually began on New Year's Day and lasted until the next New Year's Day according to the Pleiades Calendar.

The Hebrew Calendar dates from the Creation, which was supposed to have taken place 3760 years and three months before the commencement of the Christian Era, and is so constructed that the year will always begin on, or immediately after, the new moon following the Autumnal Equinox. Thus, in the Jewish calendar, the year 5698 began on Monday, September 6, 1937, and will end with Sunday, September 25, 1938. In the fall of the year when Rosh Hashanah—the Jewish New Year—arrives thousands of people in different parts of the world pause to celebrate the passing of the old year and the coming of the new. To those of us who are accustomed to living by the sun it seems rather strange to begin the year at the time of a certain new moon in September or October, but we must remember that our celebration of the first day of January as New Year's Day is of comparatively recent origin.

Although the early Hebrews preferred to allow the moon to regulate their calendar they found it necessary to live by the sun. They were forced to recognize the recurring seasons and, in order that their festivals might occur at the proper seasons, they had two kinds of years—an ordinary year of twelve lunar months (354 days) and the embolismic year of thirteen lunar months (384 days). In either case, the year is sometimes made a day longer, or a day shorter, in order that certain festivals may fall on the proper days of the week. Thus an ordinary year may contain 353, 354, or 355 days, and an embolismic year 383, 384, or 385 days. Years of 353 or 383 days are known as imperfect years, those of 354 or 384 days are common years, and those of 355 or 385 days are perfect years. This calendar appears as accurate as any other and the error after several thousand years is very small.

The names of the twelve months in an ordinary Jewish year are Tisri, Hesvan, Kislev, Tebet, Sebat, Adar, Nisan, Yiar, Sivan, Tamuz, Ab, Elul which have alternately 30 days and 29 days except when a day is added to Hesvan or taken away from

Kislev in perfect or imperfect years. In order that the Passover, the fourteenth of Nisan, may always be celebrated on the day of the full moon on, or next after, the Vernal Equinox, the month of Veadar (29 days) is inserted in embolismic years immediately after the month of Adar.

The Hebrew Calendar is probably more accurate than our civil calendar and the question as to how many lunar months shall be in a given year is settled not by chance but by mathematical means. The formula for determining which years shall contain twelve lunar months and which shall have thirteen may be reduced to the following statement, "Divide the number of the Hebrew year by 19; if the remainder be 0, 3, 6, 8, 11, 14 or 17 the year contains thirteen lunar months. All other years have twelve lunar months." If we divide the number 5698 by 19 we obtain 299 with a remainder 17, so that the Hebrew year 5698 which began on September 6, 1937, is an embolismic year of thirteen lunar months. This same period of 19 years—the Saros—is very important in predicting eclipses.

Many other peoples used a lunar calendar similar to that of the Hebrews. In the old Japanese calendar there were twelve lunar periods (354 days) in every year. These months were not named but were merely numbered and, in order to keep the seasons in their proper places, an extra month was added whenever New Year would otherwise have occurred a whole new moon too early,—about once in three years.

The Greeks also had a year of 354 days (12 lunations) which they divided into twelve months of thirty and twenty-nine days alternately. Since their year was eleven and one-fourth days short, it was necessary to constantly correct the calendar if they wished to keep the seasons in their proper places. They accomplished this by adding an extra month every other year, but they found it necessary to omit this month frequently so that there would be only three extra months every eight years. A very crude calendar indeed.

The Babylonians had a year of 12 lunar months which they corrected at more or less regular intervals in order that the seasons might be kept in step with the sun. A thirteenth lunar month was added whenever the red star Aldebaran in Taurus got into a certain position with reference to the sun and the moon on the third of Nisan.

The American Indians, like the primitive nomadic tribes on the other side of the earth, lived entirely by the moon. Their calendar was very crude, if indeed it may be called a calendar. They did not divide the day into hours, neither did they make any use of the seven-day week for they never heard of it until they came in contact with the White Man. They had no word for "year" and, although nature forced them to note recurring seasons, they had no definite idea as to the number of days in a year.

The same moon which, by its regularly recurring phases, measured time for the roving Asiatic tribes also furnished the American Indians with a set of twelve months—they called them "moons"—to which a thirteenth was added whenever necessary to keep the seasons in their proper places. Their month usually began when the crescent (new) moon first became visible in the western sky or, as the Haidas of British Columbia put it, when the moon "looks three fingers wide."

The Indians had names for the different "moons" of the year, which had a seasonal significance. But it would be too much to expect these names to be the same among all tribes, for two groups of savages living in different latitudes would probably not be engaged in the same agricultural pursuits under the same "moon."

Among the Canadian tribes the months had such names as: Wild Goose Moon, Frost Moon, Strawberry Moon, Red Raspberry Moon and Huckleberry Moon. In the Upper Missouri Valley we find such descriptive titles as: Corn is Planted, Corn is Hoed, Corn is Gathered, etc. Further south we hear of the Watermelon Moon, the Peach Moon and the Mulberry Moon. Several of the tribes, like the Choctaws and the Chickasaws, recognized the four seasons of the year and had names for them, but to most of the tribes each "moon" was a different season and was named accordingly.

The moon also regulates the Mohammedan calendar, which dates from the flight of Mohammed from Mecca to Medina on the night of Thursday, July 15, 622 A. D. In this calendar, which is used today in Turkey, Persia and Arabia, the years are

purely lunar and always consist of twelve lunar months commencing with the new moon. The Mohammedans make no attempt to keep the seasons in their proper places. Each year contains 354 days, no thirteenth month being added as in the case of the Hebrew calendar. In the course of 32½ years the Mohammedan New Year completes its backward course entirely through the seasons. The Mohammedan year 1356 began on Sunday, March 14, 1937, and will end with Wednesday, March 3, 1938.

Since the calendar we use today came from Egypt it will be of interest to investigate the early attempts of these people to keep an accurate record of the passage of time. The Egyptians seem to have cultivated astronomy from the very earliest times. They certainly knew how to find a meridian line for the Great Pyramid is said to be laid out so accurately that modern engineers could not improve upon it. The fact that both the Egyptians and the Babylonians celebrated the festival of the Pleiades, which corresponds to our Hallowe'en, suggests that both of these peoples derived their knowledge of astronomy from some common source.

Like the early inhabitants of India the Egyptians were ardent sun-worshippers. In fact, everything connected with the sunrise and the dawn was held sacred by the tribes in the valley of the Nile. The Egyptians were more interested in the heavenly bodies when they were on the horizon, either rising or setting, than when they were in any other position. This is obvious from a study of their "temples."

When we come to the question of temple-building in relation to the heavenly bodies we are considering one of the most interesting phases of ancient astronomy. These temples were so constructed that they were in reality astronomical observatories in which very accurate measurements were possible. So accurately were their lines laid out that when the heavenly body to which they were dedicated got into a certain position in the sky at sunrise, or sunset, the priests would know that a certain day of the year had arrived.

If a temple were dedicated to the sun it must be oriented in such a way that the rays of light from the rising sun, or from the setting sun, would enter the temple and penetrate the holy of holies on a certain very important day, usually the first day of the year. In a similar manner a modern church that is dedicated to St. John should be oriented in such a way that the rising or setting sun will throw its rays of light directly into this church only on St. John's Day, and a church dedicated to St. John should by no means be parallel to one dedicated to St. Matthew. In our American cities with their parallel streets this important detail is usually overlooked, but in Europe we find many of the older churches properly oriented.

The builders of all of these Egyptian sun-temples seem to have had in mind only one idea—to preserve the axis absolutely open and to arrange the construction in such a way that the rays of light from the rising or setting sun would penetrate the full length of the temple and fall upon the sanctuary at only one season of the year and on only one day.

In some parts of Egypt we find remains of solar temples oriented in such a way as to face the rising or setting sun at the time of the winter, or the summer, solstice. The famous temple of Amen-Ra at Thebes is pointed in a direction twenty-six degrees north of west which was the place of sunset at Thebes on the day of the summer solstice. When the rays of the setting sun fell upon the sanctuary of the temple of Amen-Ra the priests could then announce that New Year's Day—the most important day of the year—had arrived.

Other temples in this part of Egypt were oriented about 26 degrees south of west so as to face the setting sun on the day of the winter solstice, and the famous Avenue of Sphinxes is oriented about 27 degrees south of east so as to catch the rays from the rising sun on that same day. The priests in these temples could tell exactly when the sun had reached its farthest point toward the south, for only on that day would its light penetrate the full length of the temple. In other parts of Egypt we find temples oriented directly east and west, so that the Egyptian priests actually had the means of determining with great accuracy the days upon which the sun passed through the four cardinal points of the sky.

Although some of the Egyptian temples may have been used as places of worship

they were obviously constructed for the purpose of regulating the calendar. The Egyptians were sun-worshippers and naturally would build many temples to the sun, but some of these temples are oriented in such a way that the sunlight could not enter them on any day of the year and so they were not solar temples. To what heavenly bodies were these temples dedicated? They were constructed in a similar manner to the solar temples so that the light from a heavenly body on the horizon would penetrate into the sanctuary, but if this heavenly body was not the sun, then what was it?

Such temples were "dedicated to" the stars, that is they were built for the purpose of determining the exact date when certain stars occupied certain positions in the sky at sunrise or sunset. According to some authorities the Egyptians were star worshippers but the question naturally arises as to whether we have the right to call these ancient structures "temples" at all. Could they not have been merely huge "telescopes" which the Egyptians constructed with great accuracy so that they might have a reliable check on their calendar?

These temples were originally oriented to certain stars but unfortunately the builders were not aware of the fact that, because of the precession of the equinoxes, a given star will not always rise at the same point on the horizon. After a sun-temple has once been built it will serve its purpose for several thousand years, but a star-temple which now faces the point at which Sirius rises will be of no use after two or three hundred years because Sirius will shift its position on the horizon. The Egyptians discovered this fact and we have many evidences of the change in the direction of the axis of a temple or in some cases of the building of a second temple by the side of the first one, with its axis pointing at a slightly different angle.

The most important star to the Egyptians seems to have been Sirius which rose about the same time with the sun on the longest day in their year, New Year's Day. At this season the Nile River always rises and overflows its banks so that the Egyptians called this star Anubis, "the watch-dog of the Nile." Sirius was personified and worshipped as the god Isis and several temples were oriented to this star. By measuring the angles at which these Sirius-temples were oriented we can determine approximately the date of their construction and we find that Sirius, the brightest star in the sky, has been regulating the calendar of Egypt at least from 4200 B. C.

Not only were these huge telescopes pointed at Sirius but other bright stars were also used. In lower Egypt we find temples oriented to some of the northern stars such as those in the Great Bear and Draco, and in upper Egypt the temples seem to have been oriented to Canopus, Spica, Antares and other bright southern stars.

By means of their astronomical observatories—now known as temples—the Egyptians were able to accurately and efficiently determine the length of the solar year at least 6000 years ago. They must have also noticed the lunar month, but they did not use it for recording time. They discovered that the solar year contained 365 days and they realized that they must either live by the sun and forget the moon or regulate their affairs by the moon and pay no attention to the seasons, for twelve lunations have approximately 354 days and thirteen lunations have 383 days. Being ardent sun-worshippers the Egyptians naturally allowed the sun to regulate their calendar and the moon played no part in it.

In order to simplify their calendar and make it "perpetual" in the sense in which this word is used by modern calendar reformists, the Egyptians set aside the five days at the end of each year for worship. These days were supposed to have been the birthdays of their principal gods, the chief of whom was Ra, the sun god. The remainder of the year was divided into twelve months of thirty days each, which were merely placed in the calendar for convenience and were not in any way related to the phases of the moon.

The modern seasons—spring, summer, autumn, and winter—had no place in the Egyptian Calendar. The 360 days of their year were divided into three seasons, instead of four, called the Inundation, the Sowing, and the Harvest. The origin of the names of these seasons is obvious. The Egyptian year began on the day of the summer solstice when Sirius, the dog-star, was rising at the same time with the sun. At that time of the year the Nile River always overflowed its banks and the flood

season began. When the waters had subsided it was possible to plant their crops and the remainder of the year was naturally devoted to planting and reaping.

We find no trace of the seven-day week in the Egyptian calendar, although this was a very common unit of time among other peoples. The Egyptians divided each of the twelve months into three periods of ten days each. What a pity this feature was discarded when we took over the Egyptian calendar! Most of our present calendar difficulties could have been avoided had the ancient astrologers not forced the seven-day week upon us.

The Egyptian day was not divided into hours, as was the custom among certain other nations, but into six watches—a custom that is followed on shipboard even at the present time.

In due time the Egyptians realized that their year of 365 days was not quite long enough and festivals which should be celebrated at one season of the year were gradually shifting to other seasons. This caused confusion for some time until it was decreed in 238 B. C. that every fourth year should contain 366 days.

The Egyptian calendar was carried to Rome by the astronomer So-sigenes of Alexandria whom Julius Caesar employed to revise the Roman calendar. After this calendar had been adopted by the Roman people it naturally came down to us. Although our modern calendar is by no means perfect and stands a good chance of being reformed again very soon, it must be fairly accurate for it originated in the temples of Egypt at least as early as 4200 B. C. It was constantly tested and checked in these Egyptian observatories, the lunar month was discarded, the Leap Year was inserted and it was then turned over to the Roman Empire.

The Aztec calendar of ancient Mexico contained eighteen months of twenty days each (360 days), with five extra days at the end of the year which they called "Nemontemi," meaning extra or useless. Their year of 365 days was obviously regulated by the sun and not by the moon, and was made "perpetual" by the same method used by the Egyptians. They had no leap year, but added 13 days at the end of every 52 years, which amounted to the same thing. The famous Mexican Aztec Calendar Stone, constructed by an Aztec king in 1479 and weighing twenty-four tons, is now in the Mexican National Museum.

The ancient Persians had a solar year of 365 days. The extra quarter of a day was taken care of by adding an extra month every 120 years.

The calendar in general use throughout the world today is derived from one established by that mythical hero, Romulus, soon after he and his brother Remus had founded the city of Rome about 753 B.C. Since Romulus had no exact notion as to the number of days in a year, his attempt at a calendar was very crude. Obviously he knew nothing about the twelve constellations of the Zodiac and had never watched the sun in its annual journey from one constellation around to the same constellation again, for he had only ten months in his calendar and his year contained only 304 days. His months were of unequal length, some of them being as short as twenty days and others as long as fifty-five days.

The names of the months in the first Roman calendar were: Mars, Aprilis, Maia, Juno, Quintilis, Sextilis, September, October, November, December. 304 days.

Romulus naturally named the first month after Mars, the god of war, from whom he claimed to have been descended, and who later became the principal god of the Roman people. He noticed that during the second month of the year the ground opened up and vegetation, which had been hiding inside the earth, came out. Con-

sequently he named this month Aprilis, a word derived from a Latin verb, aperire, which means "to open up." Surely no more appropriate name could have been found for the month at the beginning of spring than Aprilis—now known as April. The third month was named in honor of Maia, the mother of Mercury, and the fourth carries the name of Juno, the wife of Jupiter and the queen of the gods.

The other months were merely numbered to mean fifth, sixth, seventh, eighth, ninth, and tenth. Thus the word "december" originally meant the "tenth" month, as any student of Latin will immediately recognize. In our modern calendar December has lost its original meaning for, because of subsequent changes in the Roman calendar, it is now the twelfth month and not the tenth. The Romans, knowing very little about astronomy, allowed the calendar to go on in this way for some time, although their year was about 61 days short. Naturally such a calendar could only lead to confusion.

When Numa Pompilius came into power about 700 B. C. he attempted to make the calendar of Romulus fit the phases of the moon by adding two months, making a total of 355 days. Immediately after December he inserted a month whose name is derived from the sacrifices (februalia) which had to be performed at that time to atone for the sins of the past year. This was followed by a month named after Janus, the god of the beginning of things, who was always represented as having a double head with faces looking forward into the future and also backward into the past.

The Roman calendar now provided for the following 12 months: Mars, Aprilis, Maia, Juno, Quintilis, Sextilis, September, October, November, December, Februarius, Januarius. 355 days.

These months contained 30 and 29 days alternately, making a total of 354 days (twelve lunations), but an extra day was added because an even number was considered unlucky. This calendar remained unaltered until 452 B. C. when, for some unknown reason, the months of Januarius and Februarius were interchanged. With this re-arrangement the order of the months corresponds with that used today, except that we do not begin our year with March.

The Romans were now living by the same lunar calendar used by the Hebrews, the Greeks, the Japanese, the American Indians and many other peoples, except for the extra day added by Numa. The 12 months were named in the following order: Mars, Aprilis, Maia, Juno, Quintilis, Sextilis, September, October, November, December, Januarius, Februarius. 355 days.

Numa's calendar of 355 days was ten and one-fourth days short so that in spite of the day added "for luck," the various festivals kept getting out of place. For example, certain festivals supposed to be celebrated at harvest time soon came to be observed immediately after the crops had been planted. In order to correct this error an extra month of twenty-two (sometimes twenty-three) days was added every two years. This month was called Mercedonius and was inserted, not at the end of the year, but immediately after Februarius twenty-third. After this month had passed, the next day was Februarius twenty-fourth, then Februarius twenty-fifth, etc., until the month of Februarius was completed.

The average year was still one day too long and Numa took steps to make the necessary correction. Had his instructions been carried out, this calendar would have been fairly accurate but the length of the extra month was left to be determined by the priests who abused the privilege and lengthened it, or shortened it, in order to increase or decrease the length of the term of office of certain magistrates. Obviously such a crude calendar had to be discarded when Rome became mistress of the civilized world.

CURRENT PRESS COMMENT

Realization Approaches

(From Oderzeitung, Frankfort, Germany)

Reform of the calendar, through the channels of the League of Nations, is now near realization. Replies received by the League, from both governments and world-churches, are entirely favorable, so that now the stage of enactment can be rapidly approached.

Conferences for this purpose are to be called early in the New Year, to formulate plans whereby the reform can be put into effect in the different countries.

Week-End Holidays Needed

New Rochelle (N.Y.) Standard-Star

Three of the major holidays in 1936 fell on Saturdays. They were Washington's Birthday, Feb. 22; Memorial Day, May 30; Independence Day, July 4. This year, Washington's Birthday was on a Monday, Memorial Day and Independence Day on Sundays.

Almost everybody concedes that holidays should come over the week-end, preferably on Mondays. There have been strong movements for reform of the calendar in this respect and only a year ago Senator Williamson introduced a bill at Albany, N. Y., which would have changed a number of the legal holidays in the State so they would come on Mondays.

There is nothing so disconcerting to business and every-day life as coming back from a holiday on a Friday, for instance, and putting in a day at the store or office on a Saturday, and then having Sunday a holiday again. Many of our holidays, after all, have been fixed as an arbitrary act by the Government rather than by any historical event.

Favor from Schools

Washington (D.C.) World Education

There is no single class of persons more plagued with the irregularities of the calendar than those who are connected with schools and colleges. The making of a school calendar is full of difficulties complicated with the eccentric incidence of the holidays, and the impossibility of making

Christmas and Easter vacations fall efficiently into the school year. All the difficulties are repeated year after year because the whole business must be done over again every time school opens.

The international advantages of The World Calendar are obvious. The movement for revision has already enlisted peoples, churches and governments everywhere, and a reform would certainly make for international union and understanding.

Man's Time

Danbury (Conn.) News-Times

Man had been in the world a long time before he pictured time as a continuous flow. Countless centuries had elapsed before he guessed at the true length of the year. Many were the means which he used to place himself in such relation to the seasons as was necessary to carry on his work of living.

At last, very slowly, the race came to a true picture of continuous time, of time measured by light years, rather than by the rising and setting of the moon.

The calendar is made by and exists for man. It needs to be made as convenient as it can be. The proposed World Calendar is a wonderful convenience. It would enable a stabilization of much knowledge capable of being formulated statistically. Sooner or later it will be adopted in place of the limping calendar which is still in use.

Time Approaches

Dallas (Tex.) News

Calendar reform has been talked of for many years, but the discussion has appeared largely academic. Tradition and inertia have stood in the way of any general change, however.

Now comes the startling information that in less than 15 months the present calendar may be discarded forever. Chile has submitted to the League of Nations a calendar agreement that, if promptly adopted and ratified, would put a new world calendar in effect on January 1, 1939. It is assumed that the United States will follow the lead of the League in any calendar change.

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AT the September Session of the Council of the League of Nations, ten nations gave their official approval to The World Calendar. On October 19, 1931, when the subject of calendar reform was considered, only two states made complete commitments of this kind.

The ground gained for calendar reform is significant, but much must still remain to be done if the world is soon to enjoy the benefits of a new calendar. The general public must be made aware of the benefits a reformed measurement of time would bring, just as groups in education, science, religion, government and industry already realize it.

The policy of The World Calendar Association will be to continue its campaign of education and to aid national committees and organizations in efforts to secure approval from their people and governments. The aim is to add further nations to the list of those which have already approved the movement, thus bringing all efforts to a successful conclusion.

We wish to encourage our membership and affiliated organizations, who have carried on so valiantly in the past, to continued efforts. It becomes essential, therefore, that every calendar committee renew its efforts within its own territorial borders to interest all their organizational groups and influential people so that they may study and approve the reform and thus become aware of its benefits.

We continue our belief in a stabilized date for Easter but recognize that, while it has economic and social aspects, it is predominantly a religious question and one that must be dealt with by religious authorities. Desirable as it is to have Easter stabilization at the same time as the reform of the civil calendar, we believe that the civil calendar can be reformed independently. We continue to invite the cooperation of religious bodies in the general subject of calendar reform, believing that a revised calendar will have great benefits for both clergy and laymen.

The World Calendar Association continues to adhere to its policy of cooperation with every group interested in calendar reform, whether political, national, professional, religious, or racial, and to act as the information center of calendar reform activity.

EXCERPTS AND REVIEWS

Clock of Time

By J. E. JONES

In the *Wyoming Gazette*

APPARENTLY it was the Egyptians who hit upon the plan of 365 days as a "regular year" which Julius Caesar later adopted. The earliest Roman calendar was 304 days. Even Caesar, who is a perfect model for our own streamlined Mussolini, threw the solar year out of joint, and in order to make a clearer adjustment Pope Gregory published a bull that clipped off 10 days. Presto change, October 5 was October 15, 1582.

And don't ask me the reason why the new style didn't get going in our own bounding land of progress until George Washington was growing up in the 18th century. It looks as though our constitutional patriots never will get over the puzzle of how George was born on February 11th and also the 22d of the same month. The whole incident sounds like a biological mystery, whereas it was only straightening out a lapse of about 11 minutes a year for 1500 years.

Gregory included muddles in his months, and we hang on to his 28 days for February, and "thirty days has" April, June, September and November. The remainder are poetical thirty-one-ers, with the leap-years for ballast and balance. A dizzy scheme of a 13-months year came out several years ago, but it failed to click.

The plan for a modified 12-months World Calendar apparently grows by leaps and bounds in public approval and without aid of selfish political or private promoter, the idea bids fair to capture the world. All the way from Mandalay to Geneva there's talk about calendar reform.

The League of Nations, fagged out by bull-headed warrior nations, has a friendly regard for calendar reform, as a measure that is likely to go far toward promoting peace in this cock-eyed world in which we live, breathe and take the choice whether to give-it-up, or fight it out. The hands of the clock of time have never been right —like they are on a railroad-man's watch,

or a modern electrical clock. How can time be accurately accounted for, you ask? Here is the answer:

The proposed World Calendar shows how all years may be alike and all quarters equal, as follows:

First Quarter—January, 31 days; February, 30 days; March, 30 days.

Second Quarter—April, 31 days; May, 30 days; June, 30 days.

Third Quarter—July, 31 days; August, 30 days; September, 30 days.

Fourth Quarter—October, 31 days; November, 30 days; December, 30 days.

Plus: An extra "Year-End Day" follows December 30, every year; each "Leap-Year Day" follows June 30 in leap years.

The present calendar and the proposed World Calendar will fall in exact relation to one another on Sunday, January 1, 1939.

New World Time Basis

By VIOLET BROWN

In the *Brooklyn Eagle Magazine*

NEXT time you find yourself with your pen poised over your checkbook and no idea as to the date, blame it on Julius Caesar's nephew. The next time your esthetic soul recoils from a hand-painted wall calendar, blame it on Julius Caesar's nephew. The next time you hear your innocent children intoning, "Thirty days hath September, April, June and November . . ." blame it on Caesar's nephew.

But do not blame too much, for though the mills of the gods grind slowly, still they grind, and retribution may come to him 2,085 years after he put time at sixes and sevens to satisfy his own egotism. For on January 1, 1939, if all goes well, there may be a new "World Calendar."

The present calendar is obviously complicated. The months have varying lengths; each month begins on different days of the week; each year holidays fall at different times; Easter wanders forlornly all over the Spring season, and Leap Year upsets amatory *mores* no end.

Neolithic man was the first to try to subdue the bird of time. He divided the year in 12 "months." The Egyptians deserted the moon for Ra, the sun god, and perfected a solar calendar, commencing with the Autumnal equinox, more than 4,000 years before Christ. Each month was divided into 30 days, with the five days left over nominally devoted to religious rites but actually devoted to festivities more nearly resembling the opening of the baseball season, a clambake and an all-night stag party. The Roman calendar, possibly with an eye to simplicity, began the year on March 25, the Spring equinox—a date considered as New Year's Day in England and the United States up to only 180 years ago—and somehow managed with 10 months. (Hence, "December," meaning the tenth month.)

Julius Caesar reinstated the present vogue of having 12 months, after he returned from Egypt, where, apparently, he dallied not only with Cleopatra but with the astronomer Sosigenes. Under the Egyptian influence, he drew up quite a nice calendar, with 31 days for the uneven months and 30 days for the even months and one day to spare every four years. This calendar was adopted in 46 B. C., and all would have been well had it not been for Julius Caesar's nephew, Augustus. The Roman Senate had named July after the noblest Roman; after his assassination, his successor and nephew decided that he, too, must have a month named after him. So he changed the month of Sextilis to August, and stole a day from poor February to make up for the shortness of his chosen month. To even matters, the 31st days were taken from September and November and given to October and December, and so was achieved an orderly system of 90 days in the first quarter, 91 days in the second and 92 days in the third and fourth quarters. The innovation of having seven-day weeks instead of Kalends, Nones and Ides, introduced by Constantine the Great, further complicated matters. Meanwhile, since the Julian year was slightly longer than the actual solar year, time kept piling up, until by 1582 the Spring equinox had retrogressed into the Winter season. This Pope Gregory XIII tried to remedy, dropping 10 days

out of the calendar abruptly and setting New Year's Day on January 1. The Roman Catholic countries adopted this reform; the Protestant did not, until 1752. During the period of change, the law courts were filled with legal battles.

If this historical summary be muddled, it is only partly the fault of the writer. Calendar history is muddled, and that, at least, the League of Nations feels it can remedy. Last January the Chilean representative submitted a draft convention, which, if ratified under certain conditions, would institute a new calendar, a miracle of order and permanency, by 1939.

Benefit to Church

By JOHN H. LORING

In the Manchester *Guardian*

AS calendar reform is being discussed at the present time, may I point out at least one benefit which the Church will gain from it? That concerns the lectionary. The present revised lectionary is at the mercy of the existing calendar, with a movable Easter and the occurrence of holy days on different days of the week in successive years.

I need only point to the problem of arranging a satisfactory course of lessons for the uncertain weeks after Epiphany and Trinity to illustrate this. A fixed Easter will help to solve the problem, but it will only solve it partially. It will not, for example, solve the problem caused by the varying number of week-days between the Epiphany and the Sunday following. If the Epiphany falls on Sunday, there is a whole week before the Sunday following; the lessons provided for that week have to be omitted *en bloc* when the Epiphany falls on Saturday.

A glance at the revised lectionary will show that three chapters of St. Matthew must be omitted in the latter case; while it is only once in seven years, on an average, when these lessons are read complete. The variable position of Saints' days in the Christian year presents another difficulty; because they interrupt the ordinary course of ferial lessons. A reformed calendar will solve all these problems. It is hoped that all Church members will take an intelligent, and sympathetic interest.

FROM THE MAIL BAG

I regard The World Calendar Plan as a necessary step towards order in world affairs.—Sir A. Daniel Hall, Director, Experiment Station, London.

It ought to be a matter for the Lambeth Conference to decide.—Rt. Rev. H. J. Mikell, Bishop of Atlanta.

I trust that the League of Nations will sanction this vehement desire to make the calendar uniform.—Dr. Diego Guzman Perez, Sub-Secretary of Labor, Chile.

The Board of Directors of the "Camara Oficial de la Propiedad Urbana de Barcelona" favors the adoption of the perpetual calendar.—Juan A. Mas Yebra, President.

The Journal is the best thing of its kind I know. Wish it had a wider circulation. The "cause" needs missionaries.—Bishop Benjamin F. Ivins, Milwaukee.

I favor the 12-month plan and believe the sooner it is brought about the better.—Lyman Carrier, Soil Erosion Service, Washington, D. C.

I have been interested in this matter for a long time. I am heartily in favor of your proposed calendar.—Walter D. Agnew, Pres., Huntingdon College, Montgomery, Ala.

Favor the calendar reform you advocate because it seems to me to offer an extremely simple and satisfactory solution of the problem.—Prof. Leon Rosenfeld, Copenhagen.

I am convinced that reform of the calendar is greatly to be desired, and that the "World" calendar accomplishes it better than any other plan suggested.—Lewis H. Fisher, Washington, D. C.

The pamphlet you have sent to me is a fine, succinct digest of information, and I believe that it should prove interesting to schoolmen who may not have followed this movement heretofore. For that matter, it provides methods of approach to the subject for those who have had previous information, and I trust that The World Calendar Association will continue

to supply with such information those of us who are otherwise too busy to seek it elsewhere.—Rev. Alfred H. Rabe, S.M., President, St. Mary's Univ., San Antonio.

I can see many good points in your calendar, and, after all, if one prefers to operate one's business on a thirteen-period calendar, as we are now doing, it can be done as well under The World Calendar as under the calendar at present in use.—R. E. Sturtevant, Treasurer, Ludowich-Celadon Company, Chicago.

One marvels at the far-reaching and beneficent effects this reformed calendar would produce.—Rev. Sylvester Briemlaier, O.M. Cap., St. Anthony's Monastery, Marathon, Wis.

I have thought a great deal about it in the past years, and I am heartily in favor of a readjustment of our calendar.—Edward M. Gwathmey, Pres., Converse College, Spartanburg, S. C.

The new calendar is going to be a *real* reform. I was opposed to it in the beginning but have come to look upon it as a good thing.—Rev. W. F. Perry, Lincoln, Neb.

I favor any plan that retains the 12 months.—Leroy S. Boyd, Interstate Commerce Commission, Washington, D. C.

In spite of all of the objections that have been raised against calendar reform, I am very much in favor of it.—Edward C. Elliott, Pres., Purdue University, Lafayette, Ind.

I hope you are successful on the 12-month idea.—C. G. Francis, F. B. Wines Co. (calendar manufacturers), Tacoma.

The Journal is very interesting and as an engineer am heartily in accord with your proposed method of calendar reform.—Howard Matson, Soil Erosion Service, Lindale, Texas.

I have been explaining The World Calendar to all of my students.—Prof. P. B. Potter, Va. Poly. Inst., Blacksburg, Va.

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EDITORIAL PARAGRAPHS

It is urged that if representatives of all the countries in the world were to give united and unequivocal support to a universal measure of time, it "mayhap" become the seed of future agreements. The plan which provides besides the equal quarters for a synchronous free day around the world might be so used as to deepen the sense of the unity of mankind.—*New York Times*.

Commercial opinion is strongly in favor of the revision. Business men declare that the Gregorian calendar—our present one—which was adopted in 1582, is obsolete, and that our dates should be altered to fit modern conditions.—*London (England) People*.

Yes, we have lived a long time on the old calendar. We are all just as old or as young, as we are. The present calendar has taken good care of that. But in this age of progressive thinking, why wouldn't a world-wide consideration of the matter, with the definite purpose of making a change for a more regular and systematic plan of time-keeping, be a splendid thing? It is interesting to note that the nations of the world are earnestly considering just such a move.—*York (Pa.) Gazette-Daily*.

Another evidence of the spirit of change abroad in the world is the momentum gained lately by the movement for a new World Calendar. The World Calendar Association is now hopeful that its program of calendar reform will be put into effect by all the civilized nations by 1929.—*Fort Smith (Tex.) Star-Telegram*.

The World Calendar Association has been working for some time to get the nations to adopt this new calendar. You'd be surprised to see what headway it has been making, in the way of securing favorable reactions to the proposal.—*Milwaukee (Wis.) Leader*.

According to reports, the possibility for a new reform of the calendar is now near realization.—*Gottingen (Germany) Tageblatt*.

All the way from Mandalay to Geneva there's talk about calendar reform.—*Mission, Tex., Enterprise*.

A writer in that determined little publication that knows what it wants, the *Journal of Calendar Reform*, points out that arranging a sensible calendar on the planet Jupiter is even more difficult than here on earth.—*Los Angeles (Cal.) Times*.

Large groups of people are sponsoring a revision of the calendar. It has now been officially supported by resolutions passed by five national scientific bodies, by the Chamber of Commerce of the State of New York and by the Assembly of the Protestant Episcopal Church.—*Industry (Ill.) Press*.

Advocates of a reformed calendar include the Astronomer Royal, Mr. H. G. Wells and the Dean of St. Pauls, according to a report issued by the Rational Calendar Association.—*Lucknow (India) Pioneer*.

The United States Naval Observatory has flatly opposed the thirteen-month calendar. It would be difficult to use and cause endless confusion, the Observatory holds. The United States Bureau of Standards takes a similar view.—*New Rochelle, (N. Y.) Standard-Star*.

The International Labour Conference at Geneva has unanimously adopted a resolution proposed by the Chilean Government delegate and supported by the Belgian delegate, urging the Council of the League of Nations to devote immediate and intensive study to the whole question of calendar reform.—*London (England) Journal of Education*.

General reform of the calendar with a fixed date for Easter is advocated by the London Chamber of Commerce in a resolution which has been sent to the Home Secretary and to the Pope. The chamber favors a perpetual twelve-month calendar divided into equal quarters of ninety-one days with New Year's Day undated.—*Springfield (Ill.) State Journal*.

The change from the Julian to the Gregorian calendar was made within the last 200 years. If there is to be any improvement worth while, there is little reason to delay its general adoption.—*Uniontown, Pa., News Standard*.



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THE WORLD CALENDAR

All Years Alike
All Quarters Equal

First Quarter

JANUARY						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
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29	30	31
FEBRUARY						
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26	27	28	29	30
MARCH						
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Second Quarter

APRIL						
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Third Quarter

JULY						
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SEPTEMBER						
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...	1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

Fourth Quarter

OCTOBER						
S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	...	...	...	...
NOVEMBER						
S	M	T	W	T	F	S
...	...	1	2	3	4	...
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	...	...
DECEMBER						
S	M	T	W	T	F	S
...	...	...	1	2	...	...
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
*						

*YEAR-END DAY, December Y, follows December 30th every year

**LEAP-YEAR DAY, June L, follows June 30th in leap years

The World Calendar is a revision of the present calendar to correct its inequalities and discrepancies. It rearranges the length of the 12 months so that they are regular, making the year divisible into equal halves and quarters in a "perpetual" calendar. Every year is the same; every quarter identical.

In this new calendar, each quarter contains exactly three months, 13 weeks, 91 days. Each quarter begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, and the other two 30 days each. Each month has 26 weekdays.

In order to make the calendar perpetual, at the same time retaining astronomical accuracy, the 365th day of the year, called Year-End Day, is an intercalary day placed between December 30th and January 1st and considered an extra Saturday. The 366th day in leap year, called Leap-Year Day, is intercalated between June

30th and July 1st on another extra Saturday. These intercalary or stabilizing days are tabulated as December 31 or Y and June 31 or L, and would probably be observed as international holidays. January 1st, New Year's Day, always falls on Sunday.

The revised calendar is balanced in structure, perpetual in form, harmonious in arrangement. It conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, coordinates the different time-periods, and stabilizes religious and secular holidays when approved by their respective authorities. As compared with any other proposal for calendar revision, it offers an adjustment in which the transition from the old to the new order can be made with a minimum of disturbance.

"Our stability is but balance."—Robert Bridges.

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STOCK EXCHANGE VIEWPOINT

By W. TRUSLOW HYDE, JR.

Economist of Josephthal & Co., members New York Stock Exchange

THE stock market, which is an integral part of our industrial life, has a vital interest in the rejuvenation of the calendar. It is the function of the stock market to enable corporations to raise capital by providing a liquid market for securities. This ready market makes it possible to assimilate the savings of millions of people for the financing of our factories, thereby reducing the cost of production and raising the standard of living.

The professional stock trader is an important cog in the machinery of this institution, because it is he who stands ready to buy or sell securities when prices fall or rise too rapidly. Numerically, these men represent a small group, but their function is indispensable to the smooth working of the stock market. They are basically merchants who buy, not for their own consumption, but for resale at a profit, and like all buyers, they must know the goods in which they deal, and more important they must be able to anticipate supply and demand.

In order to keep themselves informed as to changing conditions which would affect the values of securities, these professionals employ staffs whose duties are to interpret economic statistics. Railroad car-loadings, electric output, automobile production, retail sales and the rate of steel operations are only a few of such indices which aid in the forecasting of economic trends. Before these figures, which are published periodically, can

be used, they must be analyzed carefully to eliminate extraneous factors such as weather conditions, seasonal fluctuations and many other unusual happenings. Thus, the more eliminations and corrections which have to be made for extraordinary circumstances, the greater the chances are for error and the more difficult it is to obtain a clear picture of underlying conditions.

Calendar idiosyncrasies frequently complicate business statistics by causing holidays to fall at irregular intervals. For instance, the Fourth of July holiday this year came in the second week in July, whereas last year it fell in the first week. As a result, year-to-year comparisons of weekly statistics were inaccurate, and for two weeks it was impossible to compare with any degree of correctness the rate of business activity with that of a year ago. More specifically, railroad car-loadings in the last week of June this year were 8.4 per cent greater than in 1936. The next week showed a year-to-year gain of 24.1 per cent, part of the improvement being due to the reduced loadings last year caused by the holiday. Similarly, a comparison the following week, when a decline of 5.8 per cent was reported, was impossible because of the interruption caused by the holiday this year. When a direct comparison was available in the third week of July, a gain of 6.9 per cent over last year was revealed. Thus, between the last week in June and the third week in July, the trend compared with a year ago had become unfavorable, and yet it was impossible to note the change from the statistics issued during the interim. This is a characteristic illustration of a needless calendar error.

Another example of the difficulties which are caused by our antiquated calendar is afforded by the distortion in the earnings of retail organizations which resulted from the fact that Easter, a period of heavy sales, came in the first quarter of this year while last year it fell in the second quarter.

In the first three months of 1937, when operations were benefited by the Easter trade, net income of the Frank G. Shattuck Company, which operates the Schrafft's restaurants and candy stores, increased 56 per cent over the corresponding period last year. What part of this improvement was caused by the stimulus sales received from the holiday buying can be only estimated, but the fact that it was substantial is proven by the earnings of the second quarter of this year, which were 16 per cent under those of the second quarter of 1936. Again this figure was exaggerated by the boost which Easter sales gave earnings in the second quarter last year. As a whole, earnings in the first six months of 1937 showed a gain of only 7 per cent over 1936; but, because of tricks played by the calendar, comparable interim reports ranged from an increase of 56 per cent to a decrease of 16 per cent.

Variations in the Easter season were chiefly responsible for the follow-

ing discrepancies in the year-to-year comparisons of Woolworth's sales:

Change from 1936

March, 1937: increase 26 per cent

April, 1937: decrease 5 per cent

Students of economics adjust these figures for extraordinary occurrences and in practice make allowances for them. However, there is always some error because these influences cannot be reduced to exact formulas, and many times important trends are not ascertainable until sufficient time has elapsed to offset the initial error. A revised calendar designed to equalize holidays and seasonal variations would be far more accurate than adjusting misleading reports to an outmoded dating system.

Those who study economic trends find their work further complicated by our disorderly calendar, wherein the number of days and week-ends in quarterly and semi-annual reports vary. Some companies, in an attempt to overcome these mathematical errors, have divided their fiscal years into four thirteen-week periods. While this system may be more exact than the usual three-month quarters, because of their unequal length and different arrangement of weekdays, it is inconvenient to have these periods ending on different dates, and the convenient half-year and quarter-year divisions are completely lost. Adoption of The World Calendar with its equal quarters of the same number of days and week-ends would correct the inaccuracies inherent in the present system of unequal three-month quarters and would overcome the present nuisances of the thirteen-week system.

The technical aspects are far too complicated to discuss in detail other than to say that a perpetual calendar would simplify interest calculations of all kinds and, by having all quarters end on Saturday and start on Sunday, would reduce interruptions caused by issuance of quarterly reports.

The following statement which Mr. Thomas E. Murray, Receiver of the Interborough Rapid Transit Company, felt was necessary to explain the July, 1937, report of that company is an outstanding example of the inadequacy of the Gregorian calendar when applied to modern finance:

"The Subway Division during the month of July carried 55,703,229 passengers, a decrease of 3,175,136, or approximately 5.39 per cent compared with July, 1936. . . . Nearly one-half the above stated loss was due to irregularity of the calendar. The extra Saturday in July this year accounted for approximately 1 per cent, and the Fourth of July holiday being celebrated on Monday instead of Saturday as in July, 1936, decreased the traffic 1.5 per cent. The balance of the loss, nearly 3 per cent, represents the real loss in rate of traffic compared with July, 1936. . . .

"Compared with the preceding month the loss was 5.39 per cent as against a loss of 2.24 per cent in June, a difference in percentage points of 3.15. Allowing for the effect of the extra Saturday and the holiday, the rate of traffic declined from June less than three-quarters of one per cent."

“TIME” IN JEWISH HISTORY

By RABBI MARTIN M. WEITZ

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Orthodox Jews, Seventh Day Baptists and Seventh-Day Adventists raise definite objections to calendar reform—not to a world calendar as a whole, but to the loss of the seven-day sequence of weeks. The author examines these objections in this series of what he picturesquely calls “Footnotes on Time Among Forgotten Jewries.”

IT MIGHT prove interesting to attempt a survey of differing calendric customs for “marking time” within one world community in order to understand fully that *days* and their *ways* can survive as variant cultural lags with different cultural values in different times and places in the same world religion.

It would be resultful, then, to trace some “days” in the calendar of Israel and to observe what they were and are in and near Palestine, Babylon, Egypt—major arenas in the life-pattern of Israel. Let us begin our “footnotes” with “New Moon” and “Sabbath,” among Israel’s oldest historical and religious events.

As far back as the time of David, we observe a new moon celebration implemented with sacrifice enacted by his clan. The new moon was never mentioned among earlier older Hebrew codes, for the fourteenth or nineteenth day of the month was designated as a Sabbath, with the first day as the new moon and the fourteenth day as the full moon. That Babylonian names are basic for the Hebrew calendar, and more specifically, that the fifteenth day of every month was known as Shapatu, was a discovery made by Dr. Pincus.

The seventh day, as Sabbath, must have come from very early sources. The number seven was sacred and the Sabbath was full of restrictions, both among the Hebrews and the Babylonians. The Babylonians, however, have similar restrictions for the fourteenth, twenty-first and twenty-eighth days as well as the seventh. Such a day prohibited a ruler from tasting roast flesh, wearing a robe or clean apparel, from mounting a chariot or announcing a decision. A soothsayer could not express an oracle nor could a physician do any healing—a practice considerably modified with humanitarian intent by the Hebrews, for, in Hebraic law, any great law could be set aside for the preservation of human life.

Such data as a background suggest that the Sabbath evolved from an *irregular* and four-fold monthly experience to a *regular* weekly event. That it became a “day of reckoning” for the whole Babylonian culture-zone (including the early Hebrew culture), which embraced the Fertile Crescent from the Mediterranean to the Persian Gulf, is evidenced by

available references to major and minor peoples other than the early Hebrews, major ones such as Assyrians, and minor as Samaritans.

The Samaritans were really on the "rim of the wilderness," for they had little of direct relationship with Israel though much cultural *osmosis* occurred. They were completely lost to the area from which the Assyrians had uprooted them. The Samaritans have been dually influenced by early Assyrian-Babylonian exposures, as well as by later Hebrew patterns. Samaria, in a way, forms a barometer of calendric change, especially in the first centuries of its life, because new festivals invaded its partially familiar calendar. Especially since its emergence in 722 B.C.E.,* until 520 C.E., when it reached its zenith in population, power and influence, Samaria religiously and culturally, if not politically, maintained a separate and semi-independent life which extended to its colonies in various parts of the Near East, North Africa and Europe. (In a letter, Obadiah Yareh Da Bertinoro, a distinguished Italian rabbi, observes that no less than fifty Samaritan families resided in Cairo, Egypt, as late as 1490, when he sojourned through Egypt and Palestine, it was his opinion that 500 Samaritan families were extant in the world in his day. A scant 100 families remained in 1930.) Often the Samaritan group enacted measures deliberately to confuse erstwhile co-religionists who disowned them about the time of Ezra and Nehemiah, 450-40 B.C.E. (?), even as the erstwhile co-religionists shunted them out of the Jewish heritage by the deliberate adoption of the Assyrian block letters for the Hebrew alphabet and the incorporation of Babylonian names for the months instead of the Aramaic words used by both.

Citations as far back as 163 C.E. state that Samaritans set up false signals to confuse Jewish neighbors in their celebration of the New Year rites. Because of this, Rabbi Judah (163-93 C.E.) abolished fire signals and substituted messengers, free from Samaritan interference. It is unlikely that the Samaritans adopted Babylonian names for the months, especially when their opponents did so in order to emphasize the cleavage. Thus the Samaritans retained the older method of numbers for months, a method indigenous to their new homes and current among the Israelite peasants who remained and whom later they absorbed.

Another instance of Samaritan development of their own calendric practices, as a result of strained relations with the Jewish community in Judea, is the feast of in-gathering—the Feast of the Booths. The solemn cutting and sacrifice of a first sheaf of the new crop was a meaningful rite connected with the "day after the Sabbath," which was identified with and which followed the last of the so-called Mazzot Festival Days, according to Morgenstern in his *Supplementary Studies in the Calendars of Ancient Israel*.

Samaritans observed what we know as a later Sadducean custom and adhered to the older practice of reckoning a 50-day period from "the day after the Sabbath of the Mazzot Festival until the Sabbath Festival." A specific record is found II Chronicles 30: 1, 10, indicative of differing attitudes on the part of Samaritans and Galileans toward the central religious authority of the Temple in Jerusalem. This initial rift was deepened with time and with later apologetics and polemics in Judaism

* B.C.E. means Before Common Era. C.E. means Common Era.

and Christianity. A common attitude toward the central sanctuary, however, according to some scholars, can be traced to about 300 B.C.E.

Other divergences by Samaritans from the changed and standardized calendar fixed by Judeans are: celebration of the Sabbath from midday Friday until midday Saturday, adhesion to the ancient rather than revised reckoning of the Passover; celebration of a festival now lost and almost forgotten, the "day after the Sabbath"; complete refusal of identifying the New Year Day with First of Tishri (September-October), as well as hesitation of utilizing Babylonian nomenclature for months. Perhaps the Samaritan refusal of the second Passover recorded in II Chronicles 30: 10 is due to their objection of redating the Passover, for fear of rechanging their sacred fast (according to J. Jeremias' *Die Passahfeir der Samaritaner*). Samaritans and Sadducees, in earlier centuries, and Karaites and Falashas, in later centuries, retained earlier festivals, dates and usages for the most part, whereas Rabbinic Judaism used renamed months and emended early usages so as to become preservative forces for Israel.

Another indication for early divergence exists in references to Shiloh, a city compared to Samaria. According to Judeans, both these cities, Shiloh and Samaria, were notorious for intemperance, inasmuch as Israel, directly north of Judea, was a vine-cultivating area easily given to excess, even as was Samaria, successor to Israel's soil and "spirits." Thus feasts of vintage meant more in the north of Palestine even with the Samaritans who occupied that area after 722 B.C.E. than with the Judeans of Southern Palestine. No doubt Babylonian influence was felt for centuries in certain festivals and rites of fertility but not in names of the months. (When Nazarite orders arose even in the Samaritan *milieu* to protest Northern festival excesses, they emerged from the none-too-fertile hill country to Judea to emphasize the semi-pastoral simplicity known to early Israel.)

Here is an excellent transposition of cultural lags in the Hebrew calendar. The Judeans, before the Babylonian Exile (586-520 B.C.E.) followed a simple, semi-rigid calendation, unpalatable to Northerners. About this time, however, and because of the presence of Samaritans and an assumed need for self-immolation, the Judeans—now Jews—after their Exile in and exposure to commercial Babylon, greatly shifted the calendar. They renamed months, revised some contents from their original simplicity by way of Babylonian loans, whereas the Northerners—now the Samaritans—became the defenders of the older but simpler version of the calendar, free from Babylonian names, but now unpalatable to Judeans!

Celebration of the Jubilee is another instance of how a late group, the Samaritans, follow the earlier version, while the earlier group, the Judeans, evolve a better but later version. Samaritans calculated the seventh year of release differently from the Jews. According to the Talmud, the seventh year of release is dated from the conquest of the land and from tribal distribution, which it claims took fourteen years. This occurred in the year of the Creation 2489, an experience followed by 850 years or 17 Jubilees between that event and the destruction of the First Temple in 586 B.C.E. The last Jubilee occurred on the tenth day of Tishri in the fourteenth year after the destruction of Jerusalem.

Samaritans, however, insist, in their *Book of Joshua*, that the first Jubilee was simultaneous with the crossing of the Jordan and they cite 2794 instead of 2489 as the first Sabbatical cycle. It may be that this is the earlier as well as the simpler reckoning, for the Talmudic calculation may be centuries later than the citation in the Samaritan *Book of Joshua*. Evidently later than the Samaritan Bible is the Talmudic ruling for finding the year of release: "Add one year and divide by seven the number of years since the Destruction of the Second Temple, or add two for every century and divide the total sum by seven."

A parallel conflict with its impress on calendation is evidenced in the order of the services and in the Bible cycle of readings. The Samaritan cycle is more imperfect than that of the Jews. In their *Taulidah* (Chronicles), they ascribe computations to one Eleazar, later expanded by a high-priest at Damascus, Jacob ben Ishmael (d. 1346?), and so relayed to 1856, when their high-priest Solomon died. This "Chron-

icle" (an apology for Samaritan interpretation) begins its account with the traditional calculation of festivals and jubilees on the assumption that such chronology was direct from Adam to Pincus and through him to the Samaritan priesthood. This Chronicle is not a mere date-line for the calendar; it is the "life-line" for the priestly dynasty. But upon examination, its chronology is disturbing and dates misleading.

Early Samaritan records are simpler and their cycles have more order than chaos, especially for the first month and for the seven Sabbaths following Passover (March-April), on to the Feast of the Harvest (September-October). Divisions for the seventh month (September-October), including all the festivals through the Harvest Feast, are likewise organic in early Samaritan records, as are contents on circumcision, marriage and burial. All these records were compiled into the *Defter*, which was the first and foremost liturgy in Samaritan life. It is a composition by various authors of different times and, unlike *Al-Taulidah*, it is a "liturgy," a basis for major events, as birth and death in the life of the individual or crops and solstices in the life of the community.

From both the "liturgy" and the "chronicle" it is evident that the Samaritans were not bereft of all their ancient pre-Palestine practices before their abduction by Assyria, even as they were not wholly "introduced" to Israel's religion though they did retain zealously Israel's earlier and comparatively simpler calendric content.

Another instance of a whole movement, this time *within* Jewry and not *near* it, which was slightly influenced by Samaritan procedure and nearly disrupted the Jewish calendar by a change in observance of days rather than days themselves, was Karaism.

From the Eighth through later centuries, Karaism as a Jewish movement insisted on the "strict construction of the Constitution," so to speak (the *Torah* or *Law*), rather than the "loose interpretation" thereof (the *Talmud*). Karaites professed to follow the Bible literally to the complete neglect of rabbinic injunction. Actually, they incorporated much of Rabbinic Judaism, either directly or in change, but they also borrowed profusely from "out-groups" of pre-Medieval Jewry, such as the declining Samaritans and the rising Saracens. After the death of their founder, Annan, in 780 C.E., his views, although impractical for daily life, were followed with but slight concessions to daily demands. After the Tenth Century, however, Karaism spent itself because of a too rigid adhesion to the *discipline* rather than the *spirit* of the Torah or Law.

Calendrically speaking, the Karaite observance of the Sabbath and feast days is of special interest. They considered such days *Memorial Days* during the existence of the Temple but no longer binding at all, since the loss of the shrine in 70 C.E. Fortunately for the Jewish calendar and Jewry, Karaism was "lost" before the days were, which it discountenanced. (Among its more palatable beliefs, however, was its insistence that "resurrection of all dead" was allegorical, not actual, that the Temple was a part of the past rather than the future in the life of Israel.)

Sabbath observance was a most sombre as well as solemn experience among Karaites. They allowed no light nor fire; they permitted no departure from the home; they prohibited even light burdens on the Sabbath. Sabbath practices strangely paralleled other "Jewries," as the Falashas of Ethiopia and the Bene Abbes of Libya. (A most interesting

calendric practice among Karaites was the act of circumcision, performed at the close of the Sabbath, so that healing might begin on Sunday.) They were equally rigid in their prohibition for food preparation on holy days and their insistence that *mazzoth*, the bread of affliction, be made of *barley*; that the first of Tishri be a day of self-castigation rather than of trumpet-blowing and self-declaring; that the first of the year be the first of *Nisan* (March-April) *not* Tishri (September-October),—a practice “loaned” from the Samaritans (?); that Pentecost (in May-June) be celebrated on Sunday; that Chanukah (in December) be struck from the calendar; that Purim be a two-day *fast* instead of a one-day *feast* (preceded by a minor fast); that the *seventh* and the *tenth* instead of the *ninth* day of *Ab* (July-August) be fast days for loss of Jerusalem; and that the new moon be fixed by the earlier, simpler, but more confusing method of *observation* rather than *computation*. Annually, observes Bertinoro, the few families that lived in Cairo, in 1490, would send messengers to Jerusalem to observe the month of spring. Because of dependence on observation for intercalation, some Karaite communities would add a month while others would not!

Computation displaced observation as early as 165 C.E. in Babylonian Jewry when Samuel, an astronomer and scholar in Nahardia, rearranged the calendar. Feasts were not lifted but shifted from their former places in the calendar when he computed a cycle for 60 years. Mar-Samuel, in Babylon, also computed a solar reckoning of 365 days and six hours as the basis for the calendar. Rab-Adda, another Babylonian, determined the year as 365 days, five hours, 55 minutes, and 25 and $\frac{5}{27}$ seconds. A later authority in the same area, Saadiah (892-942 C.E.), revised calendar rules by computation.

These are instances of how Babylonian rabbis in early centuries of the Common Era departed from older lunar-premised cycles, by way of solar reckonings, how they accepted early Babylonian equivalents for names of months, introduced by the Exile but established with later rabbinic fixation of the calendar; and also how Samaritans and similar “out-group” Jewries were left in their own orbs, rather unmoved by the vital changes experienced among Jewries of Babylon, Palestine, Egypt, etc., via the “Oral Law” interpretation of Rabbinic Judaism and calculated systematic calendation.

During all these processes of calendric construction, it is not strange to find that the pattern which influenced Babylonian Jewry during and after the Exile (586-520 B. C. E.), and again after the loss of Jerusalem (70 C. E.), percolated to all corners of the Babylonian-Persian zones of empire, thus reaching half-forgotten Jewries, distant, isolated, semi-primitive Yawists, who used Babylonian names for their months. One of these, a “lost world” in Israel, an island in the Nile, was the Jewish colony of Elephantine, which lost all ties with Jerusalem in its Egyptian life, but which used Babylonian names for months at the same time and perhaps even earlier than they were in vogue among the Jewries of Palestine and Babylon.

This Nile colony might have first utilized Egyptian names, for many recovered

papyri suggest but a limited infiltration of Babylonian influence through Egyptian or Jewish missionaries or soldiers, which displaced earlier Egyptian nomenclature. Certain papyri, dated 408 B. C. E., according to Morgenstern, indicate that Jews of Elephantine wrote to the Persian governor of Egypt (for Egypt was in the Persian Empire then), who no doubt was acquainted with the Babylonian as well as the Egyptian cycles and names, yet who probably cited Babylonian rather than Egyptian names for months. Such "months" could not have come to Egyptian Jews by way of Palestine, for the Jews of Elephantine used such Babylonian names for months *long before* their citation in the Biblical saga. This island colony, inhabited by Jewish mercenaries in the employ of the Pharaohs, was settled long before the rise of the Persian Empire—certainly before its invasion of Egypt. This Jewish colony flourished, probably as early as 640 B. C. E., under Egyptian and not Persian-Babylonian control. Here is an excellent illustration of how two calendars—at least as regards their names for months—Egyptian and Babylonian, vied with each other for adoption by an incoming group of hired Israelites. A special papyrus (numbered 30) contains the Babylonian and corresponding Egyptian names for all months but Tammuz and Mar-hehwan, which occur without corresponding Egyptian terms.

Even as the Elephantine colony could choose between two competing calendars, one predominately solar and the other decidedly lunar, so too is it probable that another element determined matters. It is just as likely that Jews already in Babylon since 586 B. C. E., had influenced Darius II (known as Nothus, 424-405 B. C. E.) possibly about 419, "in the seventeenth year of Darius," to extend his edict not only to allow the return of Jews to Palestine, but also to permit the practice of a standardized calendar for the sake of religious and cultural unity. This is a measure which would unify Jewry, an already loyal group throughout all Persian satrapies, by means of a cycle of time containing Babylonian-Persian names for months and regular Jewish festivals permanently affixed therein. This influence in time may have penetrated even beyond the physical zone of Persian power to the more distant out-posts of Jewry, as far as the forebears of the Falashas on the highlands of Ethiopia. These were in some respects a long-time settlement of early temporary colonies, as the Elephantine site on the Nile, and thus were responsible for much conversion of and comingling with native stocks. It is altogether probable that these invading mercenary soldier-settlers of Egypt were Israelites, transferred by the Pharaohs from sites such as the Elephantine isle to the headwaters of the Blue Nile and Lake Tzana (named in later centuries after the Constantine of Ethiopia who introduced Coptic Christianity about the third century). It is probable that these Judean soldiers in the employ of Pharaohs spread early Judaic influence, syncretized with primitive practice about them, as far inland as the Pharaohs held sway, even into Ethiopia. We know that Judaic practices were used even before the introduction of Coptism and it is possible that the numerous semi-Judaic festivals, now observed by Falashas, had their origin in this synthesis of early pre-exilic Israelitish patterns with primitive tribalisms of the immediate environs. Such patterns were crystallized *after* the adoption of Babylonian names for months and *before* the completion of the Bible canon. The Falashas use some Babylonian-named months, and also use the Pentateuch as their only blueprint for life. Again this is indicated in that they know no Hebrew and nothing of the Talmud.

The same synthesis which developed among the Samaritans emerged after a fashion among the Falashas and in comparatively parallel centuries. For the *Debtera*, the priestly order of Falashas, is strongly similar to the *Depter* of the Samaritans. The Samaritans and the Falashas may not have influenced each other in the least, but both cultivated a common life-pattern amid the cracking of great empires, when Jewries elsewhere crystallized a "Mobile Center" in Law, Calendar, etc. This mobile center held them in unity but left such groups as Falashas and Samaritans as isolated "out-group" semi-Judaic communities rather than Jewries.

A word or two about the Falashas—Dark Jews of the Dark Continent—and their calendaration. Falashas, in common with Ethiopians, speak the native tongue, and use their sacred speech, Gheez, for the *Orit*, their *Holy Writ*. They have no Hebrew books. They know nothing of Purim or Chanukah—very important events in the

Jewish calendar elsewhere. Their Sabbath is considered to be a female deity and it is an example of early Mosaism plus the primitivism of the Ethiopian highlands, for *Sanbat Kadmai*—Sabbath—is a rigorous observance. Sabbath is the kernel to the Falasha calendar and was a “reality” prior to heaven or earth. Sanbat is an angel over the sun and the rain—the two climatic powers of the region—who will lead them to Jerusalem under the guidance of a Messiah, a Falasha version of Elijah. They sanctify the new moon by fasting and utilize only four Babylonian names for months: Nisan, Ab, Lul and Teshran. Festivals are fixed in a lunar-and-solar calendar year which adds a month every four years, whereas the regular Jewish calendar carries seven intercalated months every 19 years. An effort toward syncretism is apparent, too, in the fast days which occur invariably on the tenth of each month (an advance notice of the Day of Atonement?), the twelfth day of the month in honor of Arch-angel Michael and the fifteenth day as a remnant from Passover to Pentecost, reminiscent of the “day after the Sabbath of the Mazzot Festival until the Sabbath Festival,” cited earlier in this article.

The yearly celebration of the Passover is an example of how their whole calendar goes astray, for on the eleventh, twelfth and thirteenth days of Nisan, Falashas irregularly but religiously eat only sparse *Shimbera-bread* and slaughter their Pascal Lamb at the sunset of the fourteenth day. Different communities venture their own calculation by observation for the Passover Festival! Thus, Falashas may celebrate the same festivals in different places weeks apart. On Tabernacles (September-October) they do not enter booths customary with Israel generally, but they do eat *matzohs* (unleavened bread), an experience unknown in other areas except for Passover (March-April), which is cited by Morgenstern as a Palestinian practice in early pre-Christian centuries. The festival of in-gathering—the last day of the ninth month—is a forgotten festival in the regular Jewish calendar, but is one quite alive among Falashas, for on such a day they ascend mountains to pray and fast and offer gifts to their own order of Nazirites.

Their calendar is measured by fast rather than feast days. Not only are the tenth, twelfth, and fifteenth days of each month fast days, but also the second and fifth days of each week. A special fast season of their calendar is the first-to-ninth day of Tamuz, in commemoration of the loss of the First Temple, but strangely enough they make no provision for the Second Temple which is an event that happened after the forming of their own pattern.

Other minor and major Jewries had calendric vicissitudes, just as different experiences affected them as a people. Little is known of the Chazars, a people of unknown origin who maintained an independent kingdom from about 620 to 1015 C.E. They lived in the Crimea before the rise of Russian monarchy and their leaders adopted Judaism much in the same manner and about the same time as Clovis' conversion to Christianity. Chazars, as Samaritans and Falashas, combined Judaic or rather Mosaic “laws” with native customs, even as the Indians in Latin America synthesized indigenous Indian belief with invading Catholic ritual. Although the Chazars maintained independence for five centuries, it is doubtful if Judaism, outside the royal family, really received more than lip service. The calendar and its festivals were probably accepted indiscriminately because of “royal command.”

“Jews with the queues” might be another name for the *Tio Kino Kianwan*, a small group of Jews who were—for they no longer are—Chinese in nationality and Jewish in religion. They may have emerged as a small group of Jewish traders whose missionary influence on their immediate

neighbors brought about a self-contained religious community. No exact date is known for their appearance in China, but some records suggest a time as early as the Third Century B.C.E. Brief references to them appear in Chinese literature and often they are mistaken for Mohammedans. Specific references to them are made in 1229 and 1254 C.E., in connection with taxes and army service in local insurrections. Their entire community existed at Kai Fung Foo, about a synagogue in which 70 families worshipped. A record dated 1489 reports that the earliest residents there had come from Western lands, that an earlier structure had been built in 1163 C.E., that the founder of the Ming Dynasty had awarded them land and honor in 1139, and that festivals were observed, some of which are partially Chinese in derivation. Their calendar suggests a Sino-Judaic synthesis, with Jewish content reflective of Babylonian Jewry, because Babylonian months and many Talmudic practices were known to them.

From the above references to Jewish communities, both large and small, in ancient days, and their relation to "days and ways" of the calendar, we find that many of them had common points of departure, and that such departures led to further change in calendation or to a deeper retention of earlier and simpler calendation. In either instance, calendric changes were often parallel with life-adjustments and such adjustments proved most fruitful calendrically when old festivals were retained but revitalized with new spirit in the format of new calendation.

Even as the Jewish calendar itself was a balance of various Jewish calendars of the past and is now a standard lunar-solar framework, so the common and uncommon festivals and calendric practices among existing "out-group" Jewries, as Samaritans and Falashas, remind us of what the Calendar of Israel might have been. They serve as a further reminder that it can be changed today, if necessary, even as it was done previously and that it might have continued with confusion although picturesquely had it not been faced with crisis and conquered by change.

Whenever Jewish communities have dwelt outside of Palestine they have been minorities and often have followed a religious calendar entirely different from their secular calendar which was similar to the people among whom they dwelt. This is exemplified as early as the Elephantine colony in Egypt and as late as the diminished Samaritans in their Arab environment.

If the World Calendar in no wise sacrifices the week as is charged by many co-religionists it may indeed be another great reform worthy of consideration. If it sanctifies the week additionally in that it can reintroduce an ancient Jewish practice—a *48 instead of 24 hour* "coverage" for major rest days and festivals, it may well be time to lengthen again the one-day and one-week festivals by one-day for each. Thus Passover would be celebrated by *all* for eight, not seven days, and New Year's, for two, not one

days. Orthodox Jewry celebrates eight and not seven days for Tabernacles and Passover, and two, not one, for New Year and Pentecost, in order that Jewry all over the world shall be able to celebrate these festivals simultaneously. This practice of a lengthened festival in general is proposed in part by The World Calendar in its Year-End Day and Leap-Year Day, so that on each of these instances there would be *two* days of leisure celebrated simultaneously by the world-at-large.

Speaking for ourselves only, some of us differ with *all* orthodoxies, when we accept the Bible as "Man's account of the Divine" rather than "the Divine's account of Man" and the calendar as man's instrument for measuring time instead of as a divinely ordained system of time. "God's time" is no longer an adequate charge to be made against calendar revision, for "God's time" has been tampered with for centuries—even as mistakenly labelled "God's ways" were disturbed by social welfare, birth control, and efforts for peace in the modern world. "God's ways" to one may be "God's ills" to another. It would be best not to cite one for contempt of court if he simply disagrees with the other litigant in the case under question. "God's time" has even been heard as a charge against the international date-line. The crossing of the international date-line and its change of an entire day is a practice which according to some originally interferred with "God's time," but what is it now but a scientific reality in the laboratory of life?

We find from perusal of the history of Judaism that rigid restrictions as advanced by Karaism lost influence, even in behalf of the Sabbath, and that the liberal interpretations gained strength. Rabbinic Judaism ever permitted infringement of any or all rituals or laws, affecting even the Day of Atonement, if it meant salvation of life.

If manifold revisions can be cited in the past, not for convenience but for necessity, it may well be within the spirit of the "liberal interpretation" of our "constitution" for Religion-and-Culture, Judaism, to think through anew the problem of double-day Sabbaths *every week* (to insure Saturday for the Jew and Sunday for the Christian), lengthened Jewish festivals *every season*, and an improved world calendation in the form of a Year-End Day every year and a Leap-Year Day quadrennially.

However, these two days, according to many, would disrupt the sequence of weeks and would prove disturbing to dissenting minorities who believe in the Divine Law and who fear that a shift in the Sabbath would violate *God's Sabbath*. To them it is more than a struggle over a day; it is *the Day* that is the centrality of their "way to God."

Many elements within Jewry itself, one of the three minorities mostly involved, have changed even their days of Services from Saturday to Sunday and have shortened festivals by a day. If a *universal* two-day Sabbath by way of the five-day-work week could be established within the framework of The World Calendar, mayhap many Sunday Services current in Liberal Judaism would revert back by preference to Friday evenings or Saturday mornings, thus saving the seventh day as the Sabbath for those who so prefer.

Thus far, Orthodox Jews, Seventh-Day Adventists and Seventh Day Baptists raise definite objections, not to a World Calendar as a whole, but to the loss of the seven day sequence of weeks. From what we know of the changes of the calendar, especially in the past, the alternations of even the Jewish festivals and the varied interpretations for the "lost" and "lifted" days, we realize that the Calendar, even as the Bible, is not in a special way inspired but in a special sense *inspiring*. As the Bible may be man's human blueprint for divine goals, so the Calendar may be man's chronicle of time to achieve such goals through the leisure of a double Sabbath Day, security in a five-day-work week, and spirituality in the Sabbath (Saturday, Sunday, or both). The interruption of the seven-day-week sequence, in our humble opinion, does not violate spirituality, if one accepts our definition of it as "man's assertion of his highest purpose," or the "enshrinement of one's highest aspirations" by means of "personal therapeutics"—comfort and solace for individuals—and "social dynamics"—challenge and change, even calendar change. The World Calendar makes available more rest on more days, proffers symmetry upon the current calendar, and encourages a "liberal construction" rather than a "strict construction" of our religious "Constitution."

OBITUARY NOTES

ANDREW W. MELLON, former Secretary of the U. S. Treasury, died on August 26. He had long been in favor of calendar reform, and had publicly advocated international action in its behalf.

ROBERT UNDERWOOD JOHNSON, Director of the Hall of Fame at New York University, and poet of long renown, died on October 14. His interest in calendar reform dated from the year 1934, when the matter was brought to his attention by Bishop Manning.

Other members of The World Calendar Association who have died during the past few months include: Senator Joseph T. Robinson of Little Rock, Ark.; Col. W. C. Babcock of Washington, D. C.; Rev. Dr. William S. Young of Los Angeles; Ogden L. Mills, former Secretary of the U. S. Treasury, New York City; Rev. Dr. Francis H. Sprague of Boston; Prof. Frederick S. Dunn of the University of Oregon, and U. S. Senator Nathan L. Bachman of Chattanooga, Tenn.; Judge E. E. Good, of the Nebraska Supreme Court; W. R. K. Taylor, member of the New York Stock Exchange; Charles S. Smith, salesman, Hopkinsville, Ky.; Miss A. Marie Boggs, Bureau of Commercial Economics; B. C. J. Loder, Judge of the Permanent Court of International Justice, The Hague; Frank B. Kellogg, former Secretary of State, St. Paul, Minn; Newton D. Baker, former Secretary of War, Cleveland, Ohio.

TOO EARLY ROSH HASHONAH

By DR. ARTHUR A. FELDMAN

Rabbi, Hamilton, Ontario

(From the *Canadian Jewish Review*, June, 1937)

OUR grave Jewish problem is a manifold one, the religious part of it includes also the moon-calendar, after the reckoning of which the Jewish festivals occur. The problem, in fact, is very old and has for long caused much headwork as to how to adjust the lunar year of 354 days to the solar year of 365 $\frac{1}{4}$ days. Such an adjustment is imperative, because the festivals are seasonal. Without it we would soon have the strange anomaly of Passover in autumn, Rosh Hashonah in spring, etc.

We know for sure that the early Israelites, like the other nations of the Near East, and of elsewhere, worshipped the moon as a deity. Traces of that worship are still clearly discernible in the monthly Jewish rite of the sanctification of the moon (*kiddush ha' chodesh*). The sun-cult was also not alien to our remote ancestors, as numerous evidences in the Bible indicate. Solomon's temple faced the East, whence, from the Mount of Olives, the first rays of the rising sun reached the Foundation Stone (*Even ha' shesiyah*). Our synagogues look towards the East, not because there is Jerusalem, as is generally believed, but because the Invincible Sun (*Sol Invictus*) is seen coming from there.

The problem of the synchronization of the moon-year and the sun-year was solved in Judaism long ago, by the insertion of seven additional months of thirty days in every cycle of nineteen years. Such an arrangement was made in imitation of Babylon, where chronologists started it in 382 B. Chr. E. It is curiously identical with insertion of seven extra months in 19 years in the Chinese calendar. Owing to this adjustment, the Jewish year may be of six different lengths, even as long as 385 days.

Until not very long ago, in the ages of agriculture and primitive commerce and industry, in the ages of towering and deep faith, the moon-calendar served fairly well the religious needs of the Jews. But in our industrialized, mechanized, and scientific age, in an age of small faith, it has become harmful. This is tellingly demonstrated this year by the much too early Rosh Hashonah.

This festival will fall on September 6, on Labor Day, in summer. Amidst the general gayeties of the day, and after a vacation that is all but religious and spiritual, how in the world will the Jew possibly be able to put himself into the solemn mood that the day and season of introspection and self-scrutiny, of atonement and return, indispensably require? Our fathers and mothers earnestly prepared for the Rosh Hashonah for 30 days; many of them for 50 days; some of them throughout the whole year.

One can no more keep the Rosh Hashonah without spiritual exercises than a student can pass the examinations without studying.

A change of calendar is urgently needed. Rosh Hashonah should never come before September 21, that the Jew may have time to revive his shrivelled soul and attune it to the rigorous requirements of the solemn season. How very convenient and salutary it would be if all festivals fell on Sundays so the Jews might observe at least the mornings of them!

A change of calendar is not so much essential to the Jews in Palestine as it is to the Jews in the Diaspora. Let us not forget that Judaism, since its inception after the Babylonian captivity, has been preeminently the religion of the Jews dispersed in countries outside Palestine. It is true conditions in this respect might be reversed in the future, for several reasons.

Why shouldn't we change our calendar so as to suit our modern needs in a wholly changed world? A calendar, after all, is only a convenience. Our moon-calendar is of Babylonian origin, also in its names. The calendar and festivals are for us, and not we for them. Do we so very tenaciously and irrationally cling to the ancient calendar because in our unconscious mind we still adore the moon-gods? "There are more things in heaven and earth," and also in the depth of the human mind, "than are dreamt of in our philosophy." It cannot be for nothing that a whole people sticks to something that does not serve its purpose any longer; even more, something that does not let them satisfy their religious needs.

We are not so naive as to expect any beneficial effects on these lines. There is no authority, and there is no unity of aim, in Judaism. We Jews are dispersed, physically and mentally, inwardly and outwardly. But, as we see that Judaism, in which we lived and had our being, is fast disintegrating, for one reason, because it is heavily weighted down by a vast baggage of outworn folkways and traditions, symbols and rites, ideas and notions, that hinder religious progress, we think that it might not be without profit to know something of the history of our calendar.

It happens quite frequently that a man, when encountering existential or other difficulties, instead of fighting them in a manly manner and working out his salvation courageously, regresses to childhood or babyhood, even to the womb, becoming a neurotic or psychotic, a human derelict. The Jewish people is going through a severe crisis. Very many counsel the revival of ancient rites and symbols and ideas that originated in hoary antiquity, in the infancy and childhood of our people, when knowledge was very small, and conditions very primitive. We believe that our people has the intelligence and the courage, and also the will, to build up for itself a religion that is the expression of our purer reason, and of sentiments and emotions of which we are conscious and which are approved by the modern Jewish mind.

APPLAUSE FOR WOMEN'S CLUBS

ACTIVITIES in favor of calendar reform among women's clubs throughout the United States have occupied widespread attention since the publication of a preliminary report by Mrs. Rowland Hill Latham, who was appointed by the Executive Committee of the General Federation of Women's Clubs to make a study of the subject. Her report was published in the *Clubwoman*, official organ of the Federation, and also by several state federations in their Journals. It was reprinted in the October issue of the *Journal of Calendar Reform*.

Says the New York *Sun*: "When the General Federation of Women's Clubs holds its triennial in Kansas City next May it is likely that revision of the Gregorian calendar will be one of the subjects engaging the attention of the delegates. Women are conspicuous in the present effort to substitute a more orderly arrangement than the confused schedule by which mankind now adapts its activities to the solar year; Miss Elisabeth Achelis is president of The World Calendar Association; Mrs. Rowland Hill Latham has investigated the subject for the Federation. She recognizes the difficulty of the task, but she is convinced that 'streamlining the calendar,' as she puts it, has an importance beyond promoting convenience: 'It is one among many instances of a healing co-operation in an era of disastrous conflict.'

"Habit and familiar usage are a hard pair to overcome; there are complex religious factors that cannot be ignored in calendar revision. The women now devoting their energy to the cause may not be able to bring about revision immediately, nor do they expect to. On the other hand, there is no likelihood of any revision if women oppose it. And though success be unattained with that promptitude impatient modernity holds to be its first due and chief, the pursuit of the purpose will be one of the most fascinating in which anybody can engage; in itself it constitutes a high reward for time and intellectual toil.

"It is not to be expected that what the Federation of Women's Clubs does in Kansas City in 1938 will relieve churchmen of the obligation to pursue Easter through one of the most amazing computations in which science indulges, but it may be predicted confidently that the more diligently the delegates dig into the year, the better time they will have."

From Lowell, Mass., the scholarly editor of the *Courier-Citizen* gives full approval to Mrs. Latham's report. "Of course there's need," he says, "for making the calendar over to avoid some of the present idiocies, especially that which makes it necessary to mumble to yourself that ancient jingle about 'Thirty days hath September' before you can be sure what months have 31 days. It is bothersome to have Easter bobbing about as

it always has done. There seems to be no real need for giving February only 28 days. So the reformers have been busy inventing new schemes for telling the year's time varying from that unspeakably bad idea of a 13-month year to the very sensible scheme to which the Federation of Women's Clubs now proposes to lend the impetus of its favor, whereby there will still be 12 months, but differently arranged.

"I have dealt with this plan many times before and offer no apologies for doing it again because it seems to me very desirable that this scheme be thoroughly understood. If it once is understood, it has some chance of being adopted. If it were adopted, there would be a much simpler calendar. For instance, New Year's Day would always be a Sunday, the first day of the week, and Christmas would always be a Monday.

"On the merits of The World Calendar and the results that might follow from its adoption, there is an increasing measure of agreement. A convenient year for adopting the calendar would be 1939 for in that year January 1st falls on a Sunday as in The World Calendar. There is however, little difficulty in adopting The World Calendar on any day in the Gregorian year which happens to synchronize with a day in The World Calendar.

"The whole of mankind has never yet adopted a reform of the calendar all at once. Our present Gregorian calendar was only accepted by nations successively and a number of nations—for instance, Russia, China and Japan—delayed adoption until a comparatively recent date. In the case of The World Calendar certain nations have approved the reform and should thus be in a position to lead the way. If we are to judge by the experience of the past, other nations may be expected to follow. Is it unreasonable to suggest that the United States be among the progressive countries? It is unlikely that calendrical discrepancies between nations who have or have not adopted The World Calendar, even if such temporary discrepancies were to arise, would last for more than a brief transitional period."

Approval of the General Federation's attitude toward calendar reform comes also from New Orleans, where the *Times-Picayune* says: "This is one of the most recent matters of study for women's clubs. The latest number of the *Clubwoman*, monthly magazine of the Federation, includes an article on 'Streamlining the Calendar,' which is a follow-up of action taken at the meeting of the executive council in Tulsa, Okla., in the spring, approving of a study of the new system of reckoning time. The *Clubwoman* gives the outline for proposed changes, which clubs are invited to study preparatory to the triennial convention of the General Federation in Kansas City, Mo., in May.

"It is proposed that the new calendar go into effect in 1939. A New Orleans woman who has made a study of the streamline calendar says: 'The calendar would have to be learned only one time. It would be easier

to learn than the multiplication table. Women who haven't good memories could have the calendar engraved on their vanity cases."

The movement of organized clubwomen into the field of calendar reform means definite progress, declares the *Charleston (S. C.) Post*: "If women decide to work for a change of the calendar," says the editor, "we suspect it will be changed, eventually." He adds:

"For a long time this movement for a new calendar has been under way, although as yet it cannot be said that much progress has been made. However, since what is known as The World Calendar has been presented, its many advantages over the Gregorian calendar, which it aims to change along logical and permanent lines, have enlisted growing interest in striving for its adoption as an international enterprise. Proponents are rather optimistic over prospects for getting somewhere with it.

"The General Federation of Women's Clubs is taking an interest in the question and if this influential body of women decides, after due preliminary investigation and action, to press for the reform proposed, a lot more will be heard of The World Calendar than ever has been. The subject is being given much study by clubwomen."

From Asheville, N. C., the *Citizen* points with pride to the fact that Mrs. Latham, the moving spirit in the clubwomen's crusade, is an Ashevillian. "The clubwoman who has been appointed to present the subject to these affiliated organizations, a talented lady, happens to be a resident of Asheville. Her campaign for calendar reform is to occupy considerable attention this winter among the member organizations of the General Federation of Women's Clubs.

"There are two general schemes of calendar reform at present being talked about in the world, one of them advocating 13 months of 28 days each, and one holding on to the old scheme of 12 but arranging them into four quarters in each one of which there would be three months of 31, 30 and 30 days. This latter plan is called The World Calendar, and on the surface looks as if it may well be the scheme that will receive the final stamp of adoption.

"For the great thing in favor of this last idea is that it would meet most of the difficulties presented by our present Gregorian calendar without upsetting our habitual 12-month year. It has been pointed out that under The World Calendar most of our major holidays in this country would fall on either a Saturday or a Monday or could be made to do so, thus insuring the great modern blessing of the long week-end.

"The World Calendar people, however, don't want to be arbitrary about Easter if it hurts religious feeling. They have in mind something of the nature of the British plan, where Parliament has legalized a fixed Easter but on condition that it be approved by the churches before it goes into operation. They feel that Easter stabilization, though extremely

desirable, belongs in the realm of the churches for final decision, whereas calendar reform lies in the domain of governments for adoption."

In Los Angeles, the two leading women's editors, Gertrude Price of the *News* and Caroline Walker of the *Herald-Express*, give enthusiastic approval to the plan. Miss Price says:

"The General Federation of Women's Clubs, Mrs. Roberta Campbell Lawson, president, agrees with the idea of having two international holidays, undated, written into the calendar. In fact, it approves of the various changes favored by The World Calendar Association. These include a redrafting of the calendar months so that there shall be four quarters in the year, each composed of 13 equal-length weeks. The new calendar plan provides for an international holiday on the day between December 30 and January 1. Another would be the day between June 30 and July 1 in leap years. Action of the General Federation, favorable to this new set-up, is in line with its forward-looking attitude on affairs concerning world management."

The Charleston (S. C.) *News-Courier* agrees with Mrs. Latham that "of many proposals, one holds the field. It is known as The World Calendar and the president of The World Calendar Association is a woman, Miss Elisabeth Achelis. The World Calendar embodies simple adjustments whereby it is possible, once for all, to establish the calendar on a logical and permanent basis.

"Within the last few years countries which had been using the Julian calendar adopted the Gregorian calendar. Under the Julian calendar the new year begins two weeks after the time set by the Gregorian calendar. In some households the expression, 'old Christmas,' is a reference to the Julian calendar. Calenders have been made the same in the preponderant part of the world and clocks and watches are set by standard time, based on Greenwich. A standard calendar and standard time have overcome much confusion.

"Some nations have already approved the reform and advocates of The World Calendar believe they are making headway. If the General Federation of Women's Clubs should declare itself for the reform it would receive a strong impetus in the United States. Mrs. Latham holds that 'a calendar that is convenient for all to use makes for reconciliation.' The question of whether the Federation shall endorse The World Calendar will probably come before the triennial convention in Kansas City next spring. Meantime, the Federation hopes its member organizations will discuss the calendar and understand what it is and does."

In breezy approval of Mrs. Latham's report, the editor of the Newark (Ohio) *Advocate-Tribune* says: "The calendar has always been more or less a pain in the neck to the human race. In its most primitive form it only took cognizance of night and day. Then the seasons dawned on public

consciousness and the difficulty was presented of making the lunar months fit into a 12-month year. Greeks, Romans, Chinese and other nations all had a try at it and finally the Gregorian calendar was pretty generally adopted, as being the best of the lot, although not perfect.

"Many attempts have been made at revision, but the one known as The World Calendar seems to be the simplest yet offered. It is the best mathematical arrangement of the solar year yet devised. This calendar change is approved by the General Federation of Women's Clubs and local branches of this organization throughout the country are preparing to conduct an active campaign for its adoption. Individual members of Newark clubs endorse the idea with enthusiasm."

Both editorial writers and women's page editors give hearty endorsement to the proposal for joint studies of calendar reform by club committees and groups throughout the country, particularly in view of the fact that this movement will be under the direction of so energetic and capable a personality as Mrs. Latham. Among many editorial comments, the following show the general trend of approval for the move made by the General Federation:

Huntington (W. Va.) *Herald-Dispatch*: "This movement has been in progress a number of years and has been advocated by many groups, including the League of Nations. More important, from the standpoint of the United States, is that the General Federation of Women's Clubs is about to receive a favorable report on this World Calendar, and federated clubs everywhere are to be asked to study it."

Pottstown (Pa.) *Herald*: "Clubwomen have been making a special study of the movement to reform the calendar and in this study the Century Club of Pottstown has taken an active interest. On the merits of The World Calendar and the results that would follow its adoption, there is an increasing measure of agreement. Clubwomen will give serious thought to the subject. A calendar that is convenient for all to use is the objective."

Cumberland (Md.) *News*: "Investigation of the calendar reform movement was suggested at the meeting recently of the executive board of the General Federation of Women's Clubs, the task being assigned to Mrs. Rowland Hill Latham, who sets forth the result of the survey in the current issue of the *Clubwoman*, the official organ of the national federation. The survey approves the proposal of The World Calendar Association."

Asheville (N. C.) *Times*: "A new calendar by which Father Time will mark off his days and years is being proposed by the General Federation of Women's Clubs. North Carolina clubwomen are becoming 'calendar conscious' through the efforts of Mrs. R. H. Latham, of Asheville, a former president of the North Carolina Federation, who, as chairman of the Federation committee on calendar reform, has made an intensive study of the

matter and is urging clubwomen the world over, especially those of her own state, to study it in order to know how they stand on the matter and why."

Wilkes-Barre (Pa.) Record: "Member organizations of the General Federation of Women's Clubs are being encouraged to discuss calendar reform at their meetings, and more particularly to center attention on the proposal for the adoption of The World Calendar. Each year the movement to remove the imperfections in the Gregorian calendar gains new ground. It is a slow and tedious process to stir public opinion to the point where action will be demanded."

Hagerstown (Md.) Herald: "Changing the calendar to a more convenient arrangement of days has been a matter of discussion for years. The study has now been taken up by the General Federation of Women's Clubs. Many people welcome a proposed change. The clubwomen of the nation, ever alert to what concerns the majority, evidently feel that it is well worth considering."

Hamilton (Ohio) Journal: "Calendar reform will receive added impetus this year from the fact that clubwomen have taken it up. The General Federation of Women's Clubs will give it special attention and will take an active part in furthering it. Calendar reform has been suggested for many years, but now that the women have become interested, there seems a definite probability that something will be done."

Brooklyn Citizen: "Thousands of persons in this country are agitated over what they consider the failings of the Gregorian calendar, now in almost universal use. The latest potential convert to calendar reform is the General Federation of Women's Clubs. An article, *Streamlining the Calendar*, by Mrs. Rowland Hill Latham says the matter of supporting The World Calendar Association's campaign will be submitted to the women's clubs soon."

Shreveport (La.) Journal: "Among the most recent and modern matters of study for the General Federation of Women's Clubs is calendar reform. The last number of the *Clubwoman*, national Federation magazine, includes a story on 'Streamlining the Calendar,' which is a follow-up of action taken at the meeting of the executive council last spring, approving of a study of the new system of reckoning time. The article in the *Clubwoman* gives the outline for proposed changes, which clubs are invited to study preparatory to the triennial convention of the General Federation in Kansas City next May. A representative of The World Calendar Association is scheduled to speak at the General Federation meeting in Washington."

Hammond (La.) Progress: "A world calendar reform movement is under study by the Louisiana Federation of Women's Clubs. This is part of a nation-wide study by the General Federation. Louisiana clubwomen are urged to study the changes in the *Clubwoman*, preparatory to the triennial convention of the General Federation in Kansas City, Mo., in May, 1938."

NEWS FOR THOUGHTFUL WOMEN

By JANE CORBY

Women's Editor, Brooklyn Eagle

IT'S getting to be the fashion to say that the calendar that was good enough for Pope Gregory is by no means good enough for us. In other words, those of us who have managed to memorize the "Thirty days hath September" thing have had their agonies for nothing—the new streamlined calendar, when we get it, will make any such recourse to poetry unnecessary.

The calendar reform movement has been gathering force for quite a while and though the public hears, every now and then, faint echoes of a controversy among the calendar reformists, most of us have been only vaguely aware that mathematicians have been calculating madly and even less conversant with the reasons for this activity. But now that the League of Nations has actually submitted to all governments—including that of the United States—a draft treaty for the enactment of a revised calendar, it is time for us to pause and consider whither our calendar is drifting. There are specific reasons why women should be interested in calendar reform, according to The World Calendar Association—oh yes, there is one, right in New York City. But let's consider first what reforms are suggested. Shall we?

The objections to our present calendar, which has been in constant use for 355 years, include a very pertinent piece of criticism—it does not measure time according to modern standards. It is described by experts as inconvenient, irregular and costly. A year's calendar is duplicated only at rare intervals, and as each year is different, it's hard to reckon on what day of the week a future date will fall, to mention one drawback.

What's more, our calendar is by no means universal and there are many groups of people who use a different system for reckoning time. This was of no particular importance at the time of the Civil War, but with "Over-night Ocean Hops in Palace Planes Near," to quote one of yesterday's headlines, it is getting increasingly urgent for nations to understand each other, when they make dates. The telephone, telegraph and radio are rapidly complicating the situation by erasing boundaries and adding to the necessity for complete understanding.

The inconveniences of the present calendar are severely felt in the courts, in legislation and in government generally. Calendar irregularities prevent the smooth working of many activities and exact a toll of time and energy in straightening out difficulties which crop up in banking, shipping, insurance, labor, real estate, education, and all sorts of departments.

One of the grave defects of our present calendar is the movability of Easter. This wandering feast occurs anywhere from March 22 to April 25, and as a result, school and college heads have sizable—and recurrent—vacation arrangement problems.

Women are equally affected with men, on all these counts, of course, but they also have a more personal interest in the vagaries of the calendar. As the more economical sex, they probably feel, or will feel, once they know about it, discomfort over the wastefulness of the present system.

Women, with their natural talent for trimming down expenditures, cannot possibly feel happy over a situation which calls for losses in textile and hat industries, for instance. Yet grave losses are laid to the calendar, just on Easter's account. If it's too early, people go on wearing their winter clothes and buy no spring togs; if it's very late, everybody thinks it's too late to bother about spring clothes, anyway.

Clubwomen have a keen interest in calendar reform because the present system makes program planning difficult. Homemakers and mothers have an interest in it because a simplified calendar will simplify home management—every woman who tries to budget on a monthly basis would welcome a less fluctuating measure of days.

There are two main suggestions for calendar reform which are occupying the experts at present. The 13-month calendar is favored by one faction—including Dr. Joseph Bowden, professor at Adelphi College, who expounds his perpetual calendar theory in his new book on mathematics. The 13-month calendar would make 13 months of equal length. There are various objections—among others, that it would upset the established order of business until adjustments could be made.

The World Calendar is favored by another faction. This would not overthrow, but revise the present calendar. It would divide the year into 12 months, of a varying number of days, but each month would be balanced in structure. Each would have 26 weekdays, for instance. There would be a day left over, to be called Year-End Day and in Leap Year, there would be another extra day, called Leap-Year Day. The months would not contain an exact number of weeks, which is one of the disadvantages, but each quarter would have exactly 13 weeks. This is the new calendar favored by the League of Nations in its draft treaty.

Anyway, something's bound to happen to our present calendar before many more of its old-fashioned, lopsided years have passed. It might be a good thing for women to see to it that they get the kind of calendar they want. They have plenty of ways of voicing their opinions, once their minds are made up. Many women's clubs have already spoken on this subject; others have scheduled it for discussion on programs this year. And there is a national women's committee on calendar reform which publishes study material suitable for clubwomen.

HANDBOOK OF THE CALENDAR

Reviews of Miss Elisabeth Achelis' book "The World Calendar," recently published by G. P. Putnam's Sons, New York City.

In this book, the publishers have assembled the story of the progress of calendar reform since 1930, by assembling a series of addresses and occasional papers by the President of The World Calendar Association. The chapters are chronologically arranged. The book may be obtained through any book store at the publisher's price of \$2, or may be ordered direct from the publishers, G. P. Putnam's Sons, 2 West 45th Street, New York City.

A SUMMARY OF PROGRESS

By A. RANGER TYLER

Literary Editor of *The Knickerbocker News*, Albany, N. Y.

ONE grows optimistic for a change toward a more rational calendar, and its adoption by the entire world, as he reads Miss Achelis' new book entitled *The World Calendar*. There remains much work to be done, however, before prejudices and misunderstandings can be obviated. After all, as Miss Achelis explains more than once, this calendar reform is to come from the people, not by ukase as of old. The volume should prove an invaluable help toward showing the public the reasonableness and necessity for the change—by January 1, 1939.

The time element and the ideal of The World Calendar combine to unite this series of essays by Miss Achelis into a compact whole. Progress in the idea of a 12-month equal-quarter year and in methods of presenting the concept to similar or varying audiences also is shown as one continues reading. No doubt is left in the reader's mind as to what The World Calendar can offer humanity nor as to the proper and reasonable answers to possible objections.

Had the volume an index, it would be an almost perfect handbook for advocates of The World Calendar. The economic, social and religious, as well as international, angles have been handled intelligently and clearly. One might like to turn back to one point or another quickly, without having to scan several pages, and an index would permit this.

In a series of addresses and occasional papers such as in this book, one must expect repetition. But it strengthens rather than weakens the presentation of facts concerning the benefits to be derived from calendar reform. This feature of Miss Achelis' compilation is purely accidental and therefore more noteworthy.

The book has a satisfying quality also. We read an address before the American Bar Association in 1931. Later there is another to representatives of the same group. The latter refers to the earlier message

and gives the group's reaction to it which the original could not possibly contain. Thus is avoided the necessity for extended editorial comment or footnotes. This permits completeness to be obtained in spite of its having obviously been omitted from the original design of the addresses.

The author, as President of The World Calendar Association, has traveled extensively and interviewed men and women in all fields, in the United States and abroad. In one essay she explains the genesis of her activity in behalf of the 12-month plan as against the 13-month program advocated by George Eastman. It was the latter that aroused her interest, but she rebelled against the really revolutionary changes involved throughout the world, while she admitted the necessity for a more rational calendar. Knowing there was to be a world conference on the subject of calendar reform and that the 13-month group was to represent itself as speaking in behalf of the whole United States, she led in forming The World Calendar Association, the idea for which had already been gaining adherents abroad.

From the variety of organizations she has addressed since that time, it is evident Miss Achelis bit off a huge chunk of work for herself and a lot of going about. But the object of the 12-month plan, with its ease of change, its failure to cause social and economic upheaval and its accomplishment of a balanced calendar that would offset the major difficulties of the old, drew wide and enthusiastic support everywhere she went. Polls taken by the Association and others prove this beyond doubt.

A phase of her advocacy which interests so-called realists and naturalists is her emphasis upon the fact the proposed calendar will parallel nature in having "order but variation." The months will not all be the same as to arrangement of days in the weeks, but they will repeat themselves in an orderly manner four times a year. Nature follows some such order in the seasons and in reproduction. The stars seem guided by a similar law. Chemical changes and life and death can be included. The appeal to reason is therefore challenging.

Business men have already rallied to the support of The World Calendar. Miss Achelis' statement on the value of equal quarters for statistical comparisons is something few practical persons can resist. The present calendar's effect in disturbing business at the beginning of the social security program supports the view that a year always beginning on a Sunday is something greatly to be desired. This year, 1937, began on another day in the week and made the bookkeeping side of the new security plan annoying both to employer and worker.

Miss Achelis points out that the proposed change would continue to take cognizance of a custom as old as mankind, that of dividing time according to the seasons. This naturally appeals to farmers. For the great bulk of "average people," there is the benefit of knowing without

having to puzzle, just what day of the week is represented by a given date, for as long as the new calendar is in effect. The year is divided so evenly that home budgeting becomes easier than it has ever been before.

The benefits to educational institutions can be recognized at once. Instead of, as at present, each college and school plotting its program over the varying days and weeks, the schedule of days will be simple and understood, with only education-made changes to trouble as the years go on. Easter, for instance, now moves about so much that establishing proper semesters is made annoying and the semesters unequal.*

Sentimentalists who look always to the past and neglect the element of progress and change are brought up sharply by the author's able exposition of the comparative instability of our methods of cataloguing time, down through the ages. The fact there have been many calendars in use in different parts of the world, even within the time of American independence, or at least within the lives of those who contributed to freeing the colonies from European domination, brings home to those who may not have thought about it, that there is nothing inherently immovable in the matter of recording time. Few people stop to realize that even today there are several calendars in operation in various parts of the world.

The religious phase would seem obviously the toughest nut to crack. Traditionally, religion has been regarded as the stronghold of conservatism, even reactionism. Some of Miss Achelis' most illuminating chapters deal with this problem. Without offense to anyone, she carefully outlines what has been done by the Church as a whole in the past, what has been more recently considered in the general field of calendar reform, more particularly the Easter Act in England, and proceeds to the proposition that Easter may be tied permanently to April 8 or 22, preferably the former, because of the historical fact that the Resurrection has generally been established as taking place just 99 days from the first of the year. Her linking April 15 with the mid-month business affairs is an acceptable explanation that that Sunday should be avoided for Easter.

All but one of the final four chapters make an excellent summary of the progress attained by The World Calendar plan. The intervening chapter deals with the fine work of Lord Desborough toward calendar reform in England. The others describe somewhat in detail what leading men in several fields of endeavor think about the 12- or 13-month plans, with the bulk of polled opinion favoring the former. The American Government has taken an active hand in studying both programs—the two were presented by the League of Nations committee as being the only ones to consider—and numerous officials have indicated their preference for the 12-month program. Often the other is regarded as violent in its offense

*EDITOR'S NOTE.—Since the publication of this book the question of Easter stabilization has been clarified in the editorial of the October issue of the *Journal of Calendar Reform*.

to deep-seated human convictions and tending to disturb business practice and expenditure unduly.

Miss Achelis is expert in offering analogies to drive home the necessity for "stability, balance, equality, moderation" in the calendar reform program. The comparison is made between the present calendar with its annual scrapping of schedules, and what would happen if we were to discard our clocks and watches each year. It points out clearly the ridiculous variation and stupid irregularity of the present set-up.

The author has missed no cue. As she has continued her work she has expanded her methods of presenting the case to widely differing audiences. The chronological arrangement of her essays reveals this conclusively.

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HISTORY BOOK OF CALENDARS

By H. B. NICHOLS

Science Editor of the *Christian Science Monitor*, Boston

THERE really is a wealth of valuable information in the 189 pages of this history book of calendars. All systems of calculating days and months are considered—and what's wrong with each of them. As one might suspect, however, since the author is President of The World Calendar Association organized in 1930 and President of the central co-ordinating committee at Geneva, she seems to lean toward the "perpetual" calendar—every year the same, every quarter-year identical, balanced in structure, harmonious in arrangement, conforming to the solar year of 365.2422 days, and to the natural seasons.

But the Common Man, or Man on the Street, wants to know what's wrong with our present index to days and months, beyond the lamentable fact that Sundays, holidays and paydays don't come around often enough.

Lest such a trustful person go uneducated, or fall into the clutches of a 13-month calendar reformer (who advocates, by the way, a Friday the 13th for every month) let it be known that The World Calendar satisfies both those who believe Easter should be married for keeps to either March or April, and those who want a December "Y" day, corresponding to December 31, child of the old year.

There is much to be said for uniformity in the calendar, particularly from the standpoint of business. Modern living needs the convenience and regularity of months which do not vary in length from 28 to 31 days, or half years having from 181 to 184 days, or dates which jump around from month to month until they cover every day in the week.

The author would correct all this, giving 31 days to January, April, July and October, with the first day of these months always a Sunday. February, May, August and November would each have thirty days, with

the first always a Wednesday. The remaining months would likewise have 30 days, but the first would always be a Friday.

All of which might facilitate statistical comparisons, co-ordinate the different time periods and stabilize holidays—but what about that popular verse that starts off, “Thirty days hath September”? On the other hand, what would happen if we had to throw away last year’s clocks every January 1, or install new kitchen scales, buy new watches, change the tape measure or remodel our ideas on inches, pounds and ounces. That’s exactly what happens to the calendar.

The tale is worth the telling, for we have been since the time of the early Egyptians, Medes and Persians getting what we have today—and there’s still plenty of room for improvement.

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AN IMPROVED CALENDAR BY 1939

By LOUIS MECKER

Book Reviewer of the Kansas City *Times*

A NEW and better calendar by 1939—that is the hope of calendar reformers led by Miss Elisabeth Achelis of New York, President of The World Calendar Association. Under the present system January 1, 1939, falls on a Sunday, which would permit the new World Calendar to go into use without disturbance.

The World Calendar is a revision of the present calendar to correct inequalities and discrepancies. It rearranges the length of the 12 months so they are regular, making the year divisible into halves and quarters in a “perpetual” calendar. Every year is the same. Each quarter contains exactly three months, 13 weeks, 91 days, begins on Sunday and ends on Saturday. The first month in each quarter has 31 days, the other two have 30 days each. Every month has 26 weekdays.

To make the calendar perpetual (identical for every year), at the same time retaining astronomical accuracy, the 365th day, called Year-End Day, is an intercalary day, placed between December 30 and January 1, and considered an extra Saturday. The 366th day in leap years, called Leap-Year Day, is intercalated between June 30 and July 1 as another extra Saturday. These stabilizing days are to be observed as international holidays.

This revised calendar conforms to the solar year of 365.2422 days and to the natural seasons. Besides its advantages in economy and efficiency, it facilitates statistical comparisons, co-ordinates the different time-periods and stabilizes holidays. As compared with other proposals, it offers an adjustment in which the transition from the old to the new order can be made without confusion.

Miss Achelis thus expounds the cause she is heading in *The World Calendar*, a book published by Putnam’s Sons, New York. It includes a group of addresses and

papers, chronologically arranged, on the progress of calendar reform since 1930, the year The World Calendar Association was organized.

The center of the movement for calendar reform is the League of Nations, which has been dealing with the matter as a clearing house of research and information since 1923. More than 200 plans for revision have been presented to the League, some of them clumsy and fantastic. Only two have survived as worthy of prolonged consideration. One calls for a 13-month year and was vigorously promoted by the late George Eastman. The other is the proposed World Calendar or equal-quarters plan.

Recent religious preference in calendar reform has been for The World Calendar, the churches of the Christian world being opposed to the 13-month year because of the radical changes it would make in feast days. In 1936 agreement was reached by the Protestant and the Greek Orthodox churches to set Easter on April 8. Inasmuch as Easter fixes dates for all other feasts and fasts dependent upon it, the entire ecclesiastical year thus would be immovable. The only change to be made with Christmas and Epiphany in the proposal would be to fix them to certain weekdays, Christmas on Monday and Epiphany on Friday.

Evolution of the calendar now in use has been uncertain and arbitrary. Miss Achelis briefly recounts its history, from the time of the Egyptians to the present day.

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SPLENDID PROSE AND PERSUASIVE LOGIC

By FORREST SEYMOUR

Book Reviewer of the Des Moines *Register*

I DO not know Elisabeth Achelis, but she must be a sort of human dynamo. In 1929 the late George Eastman was using his wealth and influence to promote the 13-month calendar idea, and almost no attention was being given in this country to any proposal for a 12-month, equal-quarter calendar.

Miss Achelis stumbled into the calendar reform movement about this time largely by accident. The 13-month project disturbed her, and the fact that more moderate proposals were unable to compete with Mr. Eastman's propaganda aroused her resentment.

So she rolled up her sleeves.

Within a year she had organized The World Calendar Association with several thousand members. By 1931 her organization was arguing its case before the League of Nations calendar reform committee, and had allied itself with friendly groups throughout Europe. The Association began publication of the *Journal of Calendar Reform*, which now has a worldwide circulation. Since that time Miss Achelis has appeared before dozens of international conferences on the subject, in both Europe and America.

The 13-month calendar, impossible of division into equal fractions as it is, has steadily faded. The World Calendar has grown. Miss Achelis' book is simply a collection of her chief papers and addresses on the subject. They consist of splendid prose and persuasive logic.

COMMENT FROM OTHER REVIEWERS

Philadelphia Inquirer: Astronomy, history, religion, tradition, mathematics, superstition, industry and blind chance have each done their worst with the calendar. Now we should let common sense have a chance. . . . Miss Achelis' book is a collection of addresses and papers on the progress of calendar reform, which she has made as the President of The World Calendar Association. The membership of the Association is international, and its supporters include many famous names.—PHILIP H. JEWETT.

Albany Knickerbocker Press: There are many reasons why our present calendar should be changed and made more workable and less confusing. Changing it has been a subject of discussion for years and some time it will be changed.

But man has hesitated to deviate from tradition or heritage and it took 1,600 years to make the change for the present calendar which leaves much to be desired.

The World Calendar group proposes a 12-month calendar, with January, April, July and October, the beginning of each quarter, with 31 days each and the remaining months with 30 each. Every December 31 would be Year-End Day and Leap-Year Day would come after June 30 in leap years. It would stabilize holidays, facilitate statistical comparisons and make the business of keeping track of the days much more simple. It seems logical. It overcomes the wandering of Easter which now takes place somewhere during a 35-day period, a most confusing holiday.

The World Calendar group opposes the 13-month calendar advocates and has laid the case before the League of Nations and many other bodies. This book is a compilation of the author's addresses and relates the progress of the movement. It is well worth reading and indicates the most sensible plan proposed.—JOHN WANHOPE.

Minneapolis Star: The present calendar is rather an inefficient device, and constantly increasing pressure is in evidence to bring about a change to a calendar more uniform in its divisions of time. This book is a compilation of evidence on the subject, together with a story of the calendar from antiquity to now. To those partisans of calendar reform, and there are many, it's an excellent handbook.

Bookshop Bulletin: This book is a collection of addresses and papers related to the subject of The World Calendar, which came up for attention in two important world conferences this year. The plan is presented, its various aspects discussed, the arguments of sundry groups opposing it met, and the progress outlined. The hope is expressed that the general public will discuss the details of the plan and express their approval to back those advocating it. The movement is much further advanced than one on the outside world would be apt to know.—VIRGINIA KIRKUS.

Portland Oregonian: The case for calendar reform is here presented as the President of The World Calendar Association has stated it in various addresses. There is a difference of opinion between the 12-month and 13-month advocates. The author is of the former. Her subject has an interesting history.

Denver Rocky Mountain News: Recently there has been considerable discussion about revising our present calendar in order to simplify it and make it more logical. The 13-month calendar is one proposal under discussion, but in her book, "The World Calendar," Elisabeth Achelis, President of The World Calendar Association, has shown us the advantages of another proposed improvement. . . . In this new calendar, there will still be 12 months, and the year will be divided into quarters that are exactly alike. Holidays, when they don't fall on Mondays, will be changed so that they do. . . . Miss Achelis has illustrated that this calendar revision would be advantageous because so few changes would be necessary, and because, once adopted, the calendar would be accurate and therefore permanent.

VAN WIJK'S "GOLDEN NUMBER"

A REVIEW BY EDWARD S. SCHWEGLER, D.D.

North Collins, N. Y.

FROM Holland comes a book which will prove attractive and interesting to students of the calendar. It is entitled: "*LE NOMBRE D'OR. Etude de Chronologie Technique Suivie du Texte de la Massa Compotis d'Alexandre de Villedieu. Avec traduction et commentaire par W. W. Van Wijk.*" (La Haye. Martinus Nijhoff, 1936.)

Here is just one more indication of all the byways along which the study of the calendar will lead one. It is astounding how numerous and devious these byways are. Indeed, some of them are not byways at all: they are broad highways of knowledge in their own right.

The Van Wijk book deals with such a subject: the fascinating one of lunar and solar cycles. The problem of how to fit the moon's monthly cycle of 29½ days into the sun's yearly cycle of 365 days has puzzled calendar-makers from time immemorial. The Romans, the Egyptians, the Babylonians, the Jews, and especially the Greeks, tussled with it for centuries.

The echo of these intellectual acrobatics remains with us in our calculation of Easter. The Easter date depends upon a lunar cycle: and it is the evolution of this cycle that is treated at some length in the first part of Dr. Van Wijk's learned work.

After a very brief résumé of some technical points, the author delves at once into the Alexandrian method of computing Easter. It will be remembered that the Alexandrians, with their reputation for astronomical lore, led the whole Western Church in the matter of calculating the Easter date. Stemming from Greek ancestry, they naturally followed the very accurate Metonic cycle of 235 lunations in 19 years.

The exact details of the Alexandrian computations are still under dispute, and a new theory on the construction of the cycle used is part of what this work contributes to the literature of the calendar. The author thinks that the Alexandrian calendar consisted of two distinct cycles: one eight years long (*ogdoas*) and the other eleven (*hendekas*). An adequate judgment of this theory could only be passed by an expert on the subject of lunar cycles; and would, in any event, lead a popular reviewer into more intricacies than he or his readers could cope with.

The next section of the book treats of "Denis the Little"—Dionysius Exiguus, Scythian abbot of a Roman monastery, who introduced the use of the Christian era in the sixth century. The importance of Denis the Little in chronology is based not only on this fact, but on the further fact

that he adapted the Alexandrian cycle, which was worked out for the Egyptian calendar, to the Roman calendar and its unequal months. This gave rise to various difficulties, which are explained in detail by the author of our work. Among other interesting things in the explanation is the suggestion that the coincidence of the *ogdoas* beginning on Dec. 24 and the *hendekas* on Dec. 26 may have inspired Denis with the thought of counting events from the birth of Christ.

After describing the spread of the Dionysian calculations, Van Wijk arrives at a consideration of perpetual calendars and the Golden Number. This latter, it will be recalled, is simply the number denoting the position of a year in a Metonic cycle. If such cycles are repeated indefinitely and the years are numbered continuously throughout successive cycles from one to nineteen, years that have the same numbers—"golden numbers"—are supposed to have the new moon falling on the same days.

According to our author, the designation *golden number, aureus numerus*, is first found in a poem by Alexandre de Villedieu, entitled *Massa Compoti*, which might be translated, "Chronological Miscellany." And this brings us at once to the principal contribution which Dr. Van Wijk makes to calendar lore: the text of the poem mentioned.

Alexander of Villedieu (*Alexander de Villa Dei, Alexander Dolensis or Gallus*) lived in the twelfth century. He studied at the University of Paris, spent much time as a tutor, and died a canon of the church of St. Andrew in Avranches (Manche).

Alexander of Villedieu had a peculiar facility for didactic versification: a means of education that has long since gone into the discard. Among his works of this kind was his well known *Doctrinale*, a metrical summary of Latin grammar in 2645 verses. Less known was his *Ecclesiale*, a sort of versified encyclopedia, never published.

The *Massa Compoti* dates from about the year 1200 and contains 509 lines. Our author has collated a number of its MSS., and produces in his work what he considers to be the most reliable and faithful reading.

After the original Latin text there follow a number of alternative readings, a translation of the text into French, and a very detailed series of comments that are filled with curious calendrical lore, interesting mainly to the research scholar.

The *Massa Compoti* has four parts or chapters. The first deals with the perpetual calendar as regulated by the Golden Number; the second with methods of determining movable feasts; the third with the solar cycle; and the fourth with the lunar cycle. There is also a fifth portion of somewhat doubtful authenticity which has to do with various calendrical tables.

An example of the curious didactic versification which makes up this interesting work will not be out of place. As will be seen, the verses are

dactylic hexameters; and the point set forth (lines 232-237) is comparatively simple and familiar:

Annus solaris ex mensibus est duodenis,
qui consumantur ter centum quinque diebus
ex sexagenis, cum quarta parte diei,
ex qua perficitur annos per quatuor unus,
quem sumptum, sextis Martis conjunge Kalendis.
Hic, quia bis legitur sextus, bissextus habetur . . .

Which, after all, is a pretty succinct explanation of our leap day, and of its name in a number of modern languages.

The commentary on the poem contains many curious facts. There is, for example, an explanation of how the ancients counted off the lunar cycle on the fingers. We learn that there were supposed to be nineteen joints in the hand—three to the thumb and four to each finger.

A perpetual calendar and a good index complete Van Wijk's work. Scattered through the book, there are also a number of illustrations from old manuscripts.

On the whole, the work will be beyond the grasp of the average reader: but it will form a very valuable addition to the library of anyone who has examined at all extensively the history of our calendar, and particularly the fascinating subject of lunar and solar cycles.

In 1932 Dr. Van Wijk published a general work on the Gregorian calendar: *De Gregoriaansche Kalender*. In that book the author set it down that the Gregorian calendar is "a masterpiece which cannot be improved where clerical demands are involved." It seems to the humble reviewer that Dr. Van Wijk has refuted that statement by the mere publication of the later work. Any review of lunar cycles is the best possible proof that one element of the Gregorian calendar—the strange relic called the date of Easter—is involved in needless intricacies and bootless calculations.

JOINT RESOLUTION IN CONGRESS

CONGRESSMAN JOSEPH GRAY of Barnesboro, Pa., introduced the following joint resolution into the House of Representatives in Washington on December 7, 1937:

"Joint resolution proposing the official adoption of a revised calendar to be known as the Universal Calendar, effective January 1, 1939:

"Whereas great inconveniences and difficulties of a statistical, commercial, political, economical, religious and temporal character arise out of the use of the present Gregorian calendar:

"Therefore be it resolved by the Senate and House of Representatives of the United States of America in Congress assembled,

"That for the purpose of removing the aforesaid inconveniences and difficulties there is hereby adopted for use throughout the United States of America and all the Territories subject to its jurisdiction the following calendar: (*Diagram of World Calendar Inserted Here*).

"The above to be the official calendar of the United States of America and all Territories subject to its jurisdiction on and after January 1, 1939."

The resolution was referred to the Committee on the Judiciary and ordered to be printed under the numeral H. J. Res. 528, 75th Congress, 2d Session.

TIME THROUGH THE AGES

By ARTHUR M. HARDING

Professor of Mathematics, University of Arkansas

This is the fourth of a series of articles on the scientific backgrounds of man's system of measuring time. The writer is a distinguished member of the American Mathematical Society, the American Astronomical Society and the American Association for the Advancement of Science. He is the author of the most popular text book on astronomy which has been published in many years.

SOMEONE has said that the world got its civilization from Europe and its religion and its astrology from Asia. Surely this cannot be quite true, for the calendar by which a large part of the civilized world lives today, certainly came from Africa. But how can that be? Do we not live by a calendar that was promulgated by Julius Caesar at Rome and later corrected by Pope Gregory? True enough, but Caesar did not make the calendar. He merely imported one from Egypt.

When Julius Caesar—the Mussolini of his day—came into power, the Roman calendar was in hopeless confusion. For almost seven centuries the Romans had been living under a calendar of 12 lunar months (355 days), which they attempted to keep in agreement with the sun by adding a thirteenth month, not according to a mathematical formula as did the Hebrews, but to suit the whims of those in power. The seasons no longer came at the proper months of the year, the winter season having been advanced to autumn and autumn to summer. Having heard of the wonderful success of the Egyptians in regulating their calendar by means of their sun-temples and their star-temples, Caesar determined to adopt this solar calendar, which at that time was probably the best in the world.

The astronomer Sosigenes was called from Egypt to Rome and commissioned by Caesar to draw up a new calendar for the Roman people. Since the moon played no part in the Egyptian calendar, Sosigenes disregarded this heavenly body altogether and devised a calendar that was based upon the solar year, whose length had been accurately calculated in the Egyptian temples. The result was a calendar that is practically the same as the one we use today, with 365 days in an ordinary year and 366 days in a leap year and having approximately the same number of days in each month.

The Egyptian year contained 12 months of 30 days each, with five extra days inserted at the end in order to keep the seasons in their proper places. The Roman year also consisted of 12 months, although they were of unequal length, so that very little revision was needed in order to

make the Egyptian calendar satisfactory to Caesar. As far as the months were concerned it was only necessary to replace the Egyptian by the Roman names.

Apparently Caesar did not like the idea of having five extra days at the end of every year that did not belong to any month, for he cut off one day from Februarius—the last day of the year—so that he might have six extra days at his disposal and then added one day to Mars, Maia, Quintilis, September, November, and Januarius. Each of the odd months of the new calendar contained 31 days and each of the even months 30 days, with the exception of Februarius which had been tampered with for centuries.

The Egyptians had long since learned that a year of 365 days was about one-fourth of a day short and, since 238 B.C., had been adding an extra day every four years in order that the calendar might correct itself. Sosigenes naturally imported this idea from Egypt and added the extra day to the Roman calendar. He no longer had any use for the extra month of Mercedonius which had been added every two years to the Roman calendar, and so he gave this extra day to Februarius and inserted it immediately before the 24th of the month where Mercedonius was formerly inserted. Consequently, in a leap year the 24th day of Februarius was always repeated.

Before putting the revised Egyptian calendar into effect at Rome, Caesar made two other changes. From the very foundation of the City the Romans considered Mars as the first month of the year, but Caesar thought it advisable to transfer the beginning of the year from Mars to Januarius. Even after the Romans had adopted a calendar of 365 days, in place of their old calendar of 355 days, it was necessary to do something to bring the seasons back to the proper months. Consequently, Caesar decreed that the year 46 B.C. should contain 15 months, totaling 445 days. This year has frequently been called the Year of Confusion.

The Julian Calendar, which was used by the Roman people after 46 B.C., was as follows:

Januarius	31	days	Quintilis	31	days
Februarius	29 (30)	days	Sextilis	30	days
Mars	31	days	September	31	days
Aprilis	30	days	October	30	days
Maia	31	days	November	31	days
Juno	30	days	December	30	days
		365 (366) days			

Of course the names of the months in the last column now lost their meaning, for Quintilis was no longer the fifth month, but these names had become so fixed in the minds of the people that it seemed unwise to change them.

Soon after the death of Julius Caesar, Mark Antony suggested that the name of the month Quintilis, in which Julius was born, be changed to Julius. This is the name we use today (July). The compliment that Mark Antony paid to Julius Caesar did not in any way disrupt the calendar and it would have come down to us in this form had it not been for the jealousy and the ambition of a later emperor.

The calendar which was given to the Roman people by Julius Caesar was very sensible and regular as was to be expected, since it followed very closely the Egyptian calendar—the best one in existence at that time. In a leap year the months ran with perfect regularity, the odd months having 31 days and the even months 30 days. Even in an ordinary year there was only one thing to remember—Februarius was one day short.

When the great Augustus Caesar came into power he was jealous of everything Julius had done and especially did he resent the fact that one of the months of the year was named after his predecessor. By an imperial decree in 8 B.C. the month Sextilis—which after all had merely been numbered and not named—was changed to “Augustus” in honor of the emperor and this has remained in common use until today.

Augustus also noticed that there were 31 days in the month named Julius while there were only 30 days in his month. Consequently he satisfied his vanity by moving the 29th of Februarius to the 31st of Augustus. As a result of this change there were 90 days in the first quarter of the year and 93 days in the third quarter. Property owners who rented by the quarter strenuously objected, and Augustus satisfied them by moving September 31 to October 31 and November 31 to December 31. It was the Emperor Augustus who made it necessary for us to learn the jingle—

"Thirty days has September,
April, June, and November.
All the rest have thirty-one
Except the second month alone,
To which we twenty-eight assign,
'Til leap year gives it twenty-nine."

The Julian Calendar, as revised in 8 B.C. and used for sixteen centuries without modification, was as follows:

Januarius	31	days	Julius	31 days
Februarius	28 (29)	days	Augustus	31 days
Mars	31	days	September	30 days
Aprilis	30	days	October	31 days
Maia	31	days	November	30 days
Juno	30	days	December	31 days
365 (366) days				

It is said that several later emperors attempted to follow the lead of Augustus and name a month after themselves. Thus Nero substituted Neroneus for Aprilis, and Caligula changed September to Germanicus in honor of his father. The Roman Senate made several efforts to change the name of October. For a time it was called Antoninus, then Tacitus, and even Faustinus, after the wife of a noted emperor. When the Senate offered to call November after Tiberius Caesar he declined saying, “What will you do if you have 13 emperors?” These names, however, were never very popular and were soon forgotten.

Up to the time the calendar was revised by Julius Caesar the seven-day week was unknown to Rome. The Babylonian astrologers had invented the week of seven days as a very convenient unit for measuring time, but the Romans were still dividing the months into three unequal parts by means of the Calends, the Nones and the Ides. The Ides (Latin *Idus*), derived from an old Latin word meaning “to divide,” was a very important day in every month and divided the month into approximately equal

parts. It occurred on the 15th of Mars, Maia, Julius and October, and on the 13th of the other months. The Calends (Latin *Calendae*) was always the first day of the month and the Nones (Latin *Nonae*) was always the ninth day before the Ides, hence its name. Our word "calendar" is obviously derived from the word "calends."

The Romans did not count the days in the month as is customary now, but counted ahead as children do when they say, "It is now five days until Christmas." The days between the Calends and the Nones were called "the days before the Nones," those between the Nones and the Ides "the days before the Ides," and those between the Ides and the Calends "the days before the Calends." We speak of October 31st, meaning the 31st day since October began, but the Romans would think of this day as "the day before (Latin *Pridies*) the Calends of November." Likewise the days immediately before the Nones and the Ides were given special names signifying their position.

A glance at the calendar on the opposite page will show how the Roman people designated the different days throughout the year. For example, the ninth of September was the "fifth day before the Ides," since, in any time interval, these people always counted both ends. In a leap year an extra day was inserted before the 24th of Februarius so that this day—the sixth day before the Calends of Mars—occurred twice. Each of these years, therefore, contained a double sixth-day and was called a "bissextile" year, a term that is still used in the English language.

The Roman people continued their custom of dividing their months into unequal periods by the Calends, the Nones and the Ides until 321 A.D., when Constantine the Great adopted Christianity and legalized the seven-day week of the Hebrews. He did not, however, make use of the Hebrew names—or rather numbers—for the days of the week but chose to follow the astrologers and name them after the seven so-called planets—the sun, the moon, Mars, Mercury, Jupiter (Jove), Venus and Saturn. These names were

Dies Solis (the day of the sun)
 Dies Lunae (the day of the moon)
 Dies Martis (the day of Mars)
 Dies Mercurii (the day of Mercury)
 Dies Jovis (the day of Jove)
 Dies Veneris (the day of Venus)
 Dies Saturni (the day of Saturn)

After the addition of the seven-day week to our calendar, the origin of the term "leap year" becomes apparent. It is a well-known fact that if the Fourth of July falls on Tuesday in 1933 it will come on Wednesday in 1934 and on Thursday in 1935, but in 1936 it will "leap" over Friday and come on Saturday. For this reason a bissextile year is generally called a "leap year." There are many customs connected with leap year, some of which are based upon pure myths and legends, but not all of them. For example, it is said that a law was actually passed in Scotland in 1288 giving maidens the privilege to propose marriage during leap year.

The Julian calendar was used for 16 centuries without modification, although it provided a year of 365 $\frac{1}{4}$ days which was 11 minutes and 14 seconds longer than the true solar year. This difference amounted to one day in 128 years and in due time the astronomers noticed an advance of the seasons. In 1545 Pitatus of Verona pointed out that the Vernal Equinox had advanced from March 21 to March 11, and proposed a modification of the Julian calendar which would take care of this error. In 1582 Pope Gregory XIII decided to follow the advice of the astronomers and make the necessary correction in the calendar and, since the seasons were ten days out of place, he decreed that the day after October 4, 1582, should be October 15 instead of October 5.

Having thus restored the equinox to its proper place Pope Gregory then took another step that was intended to prevent this advance of the seasons. Since the Julian calendar gained three days in about 400 years it was obvious that, if the calendar was to be approximately correct, he must drop three days every four centuries. This was accomplished by omitting three leap years every 400 years.

The only difference between the Gregorian calendar and the Julian calendar is

that those who live by the Julian calendar have a leap year every four years while those who prefer the Gregorian calendar omit the leap year in century years not divisible by 400. The year 1600 was a leap year in both calendars, but 1700, 1800 and 1900 were not leap years in the Gregorian calendar. For all practical purposes the Gregorian calendar is sufficiently accurate. The error amounts to one day in 3,300 years, so that no further correction will be necessary until early in the 50th century when the calendar will be one day ahead of the sun.

Although many calendar systems have been used by various peoples at different times, only two of these were being used by any considerable number of people at the time Pope Gregory reformed the Julian calendar. Those nations which had been brought into close contact with the Roman Empire were naturally using the Julian solar calendar while the people of Mohammedan countries, such as Arabia, Persia and Turkey, made use of the Mohammedan lunar calendar. Although this calendar was based entirely upon the moon, it was much more accurate than the Julian calendar, the error being only one day in twenty-four centuries. After 1582 the people of the world had choice of three calendars—Julian, Gregorian and Mohammedan.

It is perhaps too much to expect the nations of the earth to ever agree on an Ecclesiastical calendar since they will probably never be able to agree upon the fundamentals of the religions upon which such calendars are based. However, modern transportation and communication have so reduced the relative size of the earth that a single calendar for regulating the civil affairs of all nations is almost a necessity.

All Roman Catholic nations immediately adopted the Gregorian calendar but the Protestant nations of the world still clung to the calendar of Julius Caesar. Their dates were, therefore, ten days apart after 1582. The year 1600 was a leap year in both calendars and the difference was still ten days until the year 1700, when the Protestants had a leap year but the Catholics did not. Consequently, the Gregorian calendar was 11 days ahead of the Julian calendar until 1800 when the difference increased to 12 days, and in 1900 to 13 days.

Protestant nations of course realized that the Julian calendar was in error but they were unwilling to adopt a revision which had been proposed by a Catholic Pope. They struggled along with their dates ten days behind the seasons until the Lutherans of Germany and Holland gave way in 1700.

Protestant England held out for almost two centuries until the House of Commons in May, 1751, passed an act proposed by Lord Chesterfield to the effect that the day after September 2, 1752, should be September 14. Since the year 1600 was a leap year in both the Julian and the Gregorian calendars the difference was only ten days until after the year 1700 when it was increased to 11 days.

At the same time the English New Year's Day was changed from March 25 to January 1, so that the year 1751 in England had no January or February and it also lost the first 24 days of March. This act of Parliament resulted in serious riots during which several persons were killed. Some of those who were paying rent wondered if they were not being cheated out of 11 days, and a third of the litigation in England during the next hundred years was in some way related to this change of the calendar.

In the meantime, on February 11, 1731, George Washington was born in one of the English colonies, which were of course using the Julian calendar. Washington was twenty years old when England adopted the Gregorian calendar and he had two birthdays every year thereafter. What had been February 11 became February 22 so we now celebrate Washington's birthday on February 22, but as a matter of fact he was actually born on February 11 and an entry in the Washington family Bible, which has been preserved, confirms this statement.

At the time of Washington's birth the year in England began on March 25 so that Washington was born near the end of the year 1731. Had the shifting of New Year's Day from March 25 to January 1 occurred before Washington's birth he would have been born early in the year 1732. It is only in this way that we can say that he was born in the year 1732. The calendar on the wall in the Washington home—if indeed his father had a calendar—at the time of George's birth read February 11, 1731.

Some of the British colonies in America were somewhat slow to revise their calen-

dars in accordance with the Act of Parliament of 1751 and the calendar was not changed in Virginia until after Washington's death. His final birthday was celebrated in Alexandria in 1799 on February 11.

After the Gregorian Calendar had been adopted by Catholic nations in 1582, by Holland and Germany in 1700, by England and America in 1752, and by Sweden in 1753, it became evident that this calendar was destined to supplant the Julian calendar at least among Christian peoples. However, several of the non-Catholic countries of the world refused to adopt the Gregorian calendar until very recent times.

Historians sometimes experience great difficulty in fixing the exact dates of important events in ancient history and who can blame them? Every nation had its own method of keeping track of the passage of time and there were almost as many different calendars as there were nations. We have had the sun, moon and stars with us always and—as is usually the case when man's choice is unrestricted—some peoples allowed the sun to regulate their calendar, others preferred the moon, and still others insisted upon using the stars. Somebody invented the seven-day week and secured its adoption by a large number of people, others were either ignorant of its existence or refused to use it.

As long as nature was in complete control of the calendar there were four seasons with which the solar year might begin, any one of which would be a perfectly "natural" New Year's Day. Primitive peoples watched the rising sun swing back and forth along the eastern horizon like a gigantic pendulum, each of whose vibrations we call a "year," and fixed New Year's Day at four different seasons to suit their fancy.

Some began their year when the sun was farthest north (now June 22) as did the ancient Egyptians, or when it was farthest south (now December 22), which was Christmas Day many years ago. Others found it more convenient to have the year begin with the Vernal Equinox (now March 21), while still others preferred to start a new year with the Autumnal Equinox (now September 23), which is the beginning of Spring in the southern hemisphere.

New Year's Day was always celebrated by elaborate religious observances, so that the question of determining the exact day when the sun reached a certain position in the sky was of the utmost importance. The early Egyptians were not the only ones who carefully designed "temples" and oriented them in such a way that they might know the exact day when the sun reached the Summer Solstice—the Egyptian's New Year's Day. The pre-historic inhabitants of England also began their year at the Summer Solstice and erected a huge "temple" in order that they might know the exact time when the sun reached this point in the sky. On Salisbury Plain lie the ruins of what was probably at one time an astronomical observatory constructed on the same principle as the sun-temples of the Egyptians but not on such an elaborate scale. It is very probable that Stonehenge, as these ruins are called, was erected about 1680 B.C., when the midsummer sun rose exactly in a line with the axis of the structure.

Every early nation had its own method of determining when the new year began. Some of these, although built upon correct principles, were very crude indeed. For example, Murdock in *Our Primitive Contemporaries*, says that the Haida Indians of British Columbia begin their year with the first new moon after the Winter Solstice and that they have a unique method of determining this date. Each morning at dawn the light from the rising sun passes through a knot-hole in the eastern wall of their hut and strikes the opposite wall. This spot they mark with charcoal. The resulting line of marks is their solar calendar. At each solstice the sun reverses its direction and the ray of light on the wall starts back toward the other end of the line.

Even after the Julian Calendar had been adopted by most Christian nations they still could not agree on the season at which the year should begin. Some made the year commence with March as in the old calendar of Romulus; others chose January as the first month of the year, while others preferred to have the year begin on Christmas Day or on Lady's Day (March 25), which was the Vernal Equinox long, long ago.

The Athenians began the year at the Summer Solstice, the Macedonians in September, the Persians on March 21 (beginning of Spring), the ancient Mexicans on February 23, and the Japanese and Chinese, until recently, late in January or early

in February. Most of the Indian tribes of North America seem to have begun their year at the first new moon after the Vernal Equinox but this custom was by no means universal. Some tribes preferred to have their year begin at harvest time, others at the Summer Solstice, and still others, like the Eskimos, at the Winter Solstice.

If we could only drop ten days from one of our years and have New Year's Day come on what is now the 22nd of December our calendar would be in step with nature and every year would begin on that day—the Winter Solstice—which has long been celebrated as the birthday of the sun-god. This could be easily done by an international agreement that the day after the 21st of December next year shall be the first of January.

The day was such an obvious unit of time that it was naturally used by all peoples, but they were unable to agree as to the time the day actually began. To some nations it seemed natural to have the new day begin at sunrise, when the life-giving sun first appeared above the eastern horizon, and it was so ordered. Some preferred to have the day begin at sunset, others started their day at noon when the sun's daily journey was half completed and, to show the perversity of human nature, still others insisted upon having a new day begin at midnight. What a task lies before any modern "efficiency expert" who may attempt to reconcile the calendars of his ancestors!

Among the Jews, the ancient Greeks, the Chinese, the Bohemians, and among the Italians until recently, the civil day began in the evening. "And the evening and the morning were the first day." All Jewish festivals which last one or more days begin in the evening and end in the evening. The Jewish Sabbath extends from the evening of one day to the evening of the next. Throughout the modern Mohammedan world the day begins at sunset. Among Syrians, Babylonians, Hindus and modern Greeks the day begins at sunrise.

The Arabians start their day at noon and, until very recently, the astronomers followed this custom because they wanted to work all night and did not like to change the date while they were working. The Egyptians and ancient Romans began their day at midnight, as do all European and American nations today.

Mother Earth has given us two natural units of time—the day and the year—with which man has been able to keep a fairly accurate record of his past history, although he and his neighbors have not always been able to agree as to the best and most convenient time for commencing either of these time-cycles. When we learn that different nations began their day at different times—sunrise, sunset, noon and midnight—and their year at various seasons, how can we expect them to agree upon a date from which time should be reckoned?

The Jews reckoned their time from the creation of the world as recorded in their sacred books. Of course this date cannot be determined with any degree of accuracy, although it has been computed by some people to their own satisfaction. The Jewish year 5696 began on September 28, 1935. Of course we know that man has been on the earth much longer than 5696 years.

The early Greeks reckoned time by the four-year intervals between the Olympic Games, which were known as Olympiads. They counted forward and backward from the establishment of these games in 776 B.C. until near the end of the fifth century B.C. when Meton discovered that in 19 years the moon would go through almost exactly 235 lunations. In the year 432 B.C. the Metonic cycle was adopted in all the cities and colonies of Greece and played a very prominent part in the civil calendar. This was a great event in the early astronomy of Greece and the calendar was engraved in letters of gold on the wall of the Temple of Minerva, each year being designated by its number in the cycle of 19 years. This explains the origin of the Golden Number which is used today in the Ecclesiastical Calendar.

The Romans dated everything from the founding of the city in 753 B.C. by their mythical hero, Romulus. For many years after the establishment of the Roman Empire time was reckoned from the beginning of the reign of Augustus which, according to our calendar, was February 14, 27 B.C. In fact our English word "era," which was formerly spelled "aera," is made up of the initials of the words "ab exordio regni Augusti" which, when translated into English, mean "from the beginning of the reign

of Augustus." Early ecclesiastical writers preferred to measure time from the birth of Abraham, which is supposed to have taken place in 2015 B.C.

The Mohammedans date all events from the flight of Mohammed from Mecca to Medina (July 16, 622 A.D.) and all Christian nations now reckon time both forward and backward from the year of the birth of Christ. It seems that no attempt was made to identify this date until many years after the crucifixion. In fact, it was not until about 800 A.D. that Charlemagne, the first of the Holy Roman emperors, officially adopted the year of the birth of Christ as a starting point for reckoning time. Unfortunately, the scholars now tell us that an error in calculation was made so that what we call the beginning of the Christian era is merely an arbitrary starting point, Christ having been born five years before that date.

CHRONOLOGICAL ERAS

Name	Began
Jewish Mundane Era.....	B.C. 3761, Oct. 1
Era of Abraham	" 2015, Oct. 1
Era of the Olympiads	" 776, July 1
Roman Era (A.U.C.)	" 753, April 24
Era of Metonic Cycle	" 432, July 15
Julian Era	" 45, Jan. 1
Augustan Era	" 27, Feb. 14
Christian Era	A.D. 1, Jan. 1
Mohammedan Era	" 622, July 16

In all Catholic and most Protestant countries, church festivals are regulated by the Ecclesiastical Calendar which depends partly upon the apparent motion of the sun among the stars and partly upon that of the moon. Hence the church calendar provides for movable feasts and immovable feasts. Easter, Ash Wednesday, Palm Sunday, Good Friday, Ascension and Pentecost are determined by the moon and are celebrated on different days in different calendar years, but Christmas, which was originally a sun-festival, is regulated by the sun and is one of the immovable feasts.

The Jews celebrated their Passover on the 14th day of Nisan, their middle lunar month of spring. Since their months began at the time of the new moon, this festival always occurred at full moon and was independent of the day of the week. Some of the fathers of the early Church preferred to have Easter come on Sunday and as early as the second century of our era great disputes arose among the Christians as to the proper time to celebrate Easter, which governs all the other movable feasts.

In order that there might be agreement among all Christian peoples the Council of Nicea in 325 A.D. ordained that the first Sunday after the full moon of Nisan (Passover) be Easter Day. Should the full moon occur on Sunday the celebration of Easter was to be deferred until the Sunday following, in order to avoid concurrence with the Jewish holiday. Easter is still celebrated on the first Sunday after the first full moon upon or following the Vernal Equinox and, being regulated by the moon, is a movable feast.

The edict of the Council of Nicea has been observed through the ages in spite of the difficulties which present themselves to one who attempts to calculate in advance the date of Easter according to our civil (Gregorian) calendar. The early fathers knew very little astronomy and were probably unaware of the practical difficulties in the way of reconciling the seven-day week, the lunar month and the solar year.

Tables have been prepared from which we can find the day of the week corresponding to a given day of any year and also the age of the moon at the beginning of the year. In the front of our Prayer Books are elaborate tables of Golden Numbers, Cycles and Epacts, by which one can find the date of Easter during the sermon. If you have never engaged in this sport you may want to try it some time.

TABLE OF EASTER DATES

1931.....	April	5
1932.....	March	27
1933.....	April	16
1934.....	April	1
1935.....	April	21
1936.....	April	12
1937.....	March	28
1938.....	April	17
1939.....	April	9
1940.....	March	24
1941.....	April	13
1942.....	April	5
1943.....	April	25
1944.....	April	9
1945.....	April	1
1946.....	April	21
1947.....	April	6
1948.....	March	28
1949.....	April	17
1950.....	April	9

A STEP IN HUMAN PROGRESS

By HERBERT H. HARVEY

Esperanto Society

AS a member of an organization which is seeking concerted international action on a crusade for the general good of humanity, I have had occasion frequently to refer to the methods by which the cause of calendar reform has been advocated and promoted.

My first favorable impression of the organizations behind calendar reform came when I wrote to The World Calendar Association for literature. The response was amazingly prompt, and the printed material which came to me was comprehensive, clear, intelligent and well coordinated.

With the literature which I had requested, the Association sent me a membership card. The fact that membership in this Association is entirely free is only another proof that some of the best things in life are as free as the air we breathe.

I have informed members of the Esperanto Society that the methods used by the calendar reform groups have some useful lessons for our own movement. We have a keen and natural interest in any program of this kind. And if anyone should be able to understand the broad aims of calendar reform and to cooperate in helpful ideas for its advancement, it should be advocates of Esperanto, because our aims are similar. To us the use of a universal language is the boldest innovation ever proposed for international action, mutual helpfulness and universal accord. Our movement is an attempt to break down the greatest of all walls between nations, a wall which is not merely a language barrier but a part of other prejudices.

Our movement has many sides, but that very fact is a weakness if it leads us to scatter our efforts. The calendar reform movement, on the other hand, has an admirable singleness of purpose and direction which we would do well to study and imitate. The plan of action on which calendar reform groups are proceeding finds its central outlet in the League of Nations. Through this body they announce and proclaim to every nation the progress made, so that each step becomes a *fait accompli*.

This is important, because each nation is prone to think that it suffers less than its neighbors from the irregularities and inefficiencies of the present calendar. Therefore, each nation's acceptance of the steps in progress becomes a definitely brotherly act and thus a strengthening power.

Old-fashioned diplomats are a curious people. Owing to the intense rivalries between nations, every such diplomat feels that he must be a friend only to those forces which will weaken neighboring nations. Such diplomacy is a double-edged sword which is always wielded covertly under

the guise of getting the last grain of good for its own people. If that last grain of good should happen to be the last drop of life from a neighbor's veins, so much the better! But in the end such action always results in loss to the aggressor. The advocates of calendar reform are taking the wisest and most progressive action against this sort of diplomacy.

One feature of The World Calendar which first attracted me is the arrangement whereby the first day of the year is Sunday, and the day before it is a year-end holiday. The early Christians, as I recall it, changed their calendar to make the Lord's Day come on the first day of the week, instead of the last day of the week, in order to coincide with the Resurrection. Up to that time, only the Prophets had recognized that spiritual things should always come first—before material things—no matter where man in his blindness might want to put them. Today practically all leaders of great religions emphasize this profound fact. Preachers in their sermons attack politicians and diplomats as "opportunists" whenever these representatives of the people fail to put first things first. I like to see Sunday made the first day of the year. This will further stress the fact that material things are in the nature of "effects," whose causes will be found upon examination to lie deep in spiritual things. And stressing of this fact will urge mankind to cease catering to expediency and opportunism. Thus the progress of the world will find itself on safer ground.

I like the idea of a leap-year day devoted as an international holiday to matters of international importance—improvements in international law, weights and measures, a world monetary system, a world language. Such a leap-year holiday will have a tremendous influence in the world.

I have studied the history of the calendar with considerable interest. The Egyptian calendar was the best calendar in the world for thousands of years, but it had two very bad defects. In addition to its revolving week days (with which we are still saddled), it had the fatal weakness of not recognizing leap years. This caused the months to revolve, also. The months drifted from season to season, so that the Nile farmer was unable to calculate (without priestly aid) when the flood was coming and when the various seasons for planting, cultivating and harvesting would occur. Wise rulers tried to remedy this situation—about 300 years before Julius Caesar, Ptolemy III (called Exergetes or Benefactor) decreed that every fourth year should have an extra day. But efforts to enforce this reform failed, because of the power of a corrupt priesthood. It remained for Julius and Augustus Caesar to enact this essential reform, and for Pope Gregory XIII to make it scientifically accurate.

All calendar reforms of the past have been made by popes or autocrats with power to enforce them arbitrarily. Today, for the first time it appears to be possible for nations and peoples to make calendar reform a voluntary matter. If achieved, it will mark a great step in human progress.

CURRENT PRESS COMMENT

Popular Opinion in Favor

Gloucester (England) Echo

That there is bound to be some opposition to the formation of a "World Calendar" is a foregone conclusion, but it may be safely anticipated that the vast majority of thinking people will favor an innovation that will immensely simplify the reckoning of the days and months that combine to make a year.

Certain it is, at any rate, that popular opinion in England has undergone a change for the better since the days when an alteration of the calendar stimulated not only oral antagonism but passionate enmity.

That was in 1752 when in order to adopt the Gregorian calendar it was enacted by Parliament that eleven days should be omitted after September 2, so that the ensuing day should be the 14th.

Simplicity Needed

Giornale di Genoa

The World Calendar has an element of simplicity and rationality, and receives sympathy for the advantages it brings to every-day life, especially to commercial transactions.

Strong opposition is to be expected from selfish interests. The Church and the astronomers perhaps will not be unanimous for this innovation, although we sincerely hope that something will be done soon to bring this much-needed reform about.

The times in which we live demand simplicity and practicability; and therefore the courageous abandonment of old forms, because these forms were born of particularistic considerations, valuable only during the times in which they originated, is to be applauded.

Journalistic Approval

Lansing (Mich.) State Journal

Calendar reform not so many years ago was something obnoxious. Now it is not. If one were to look back in the files of

The *State Journal*, one would find plenty of opposition to the calendar reform proposed at that time. But now we are for it. The *State Journal* has not changed. The folks who would better the calendar have acknowledged their error and have become more reasonable.

Most religious bodies have now withdrawn their opposition. The Christian world which cannot get together on much else, has tacitly agreed that a stationary Easter and dependable other religious anniversaries will be acceptable to them.

The proposed calendar is not a radically changed affair. It is not created out of new cloth, so to speak. It is merely a revision of the present calendar with a view to eliminating inaccuracies and rendering it "perpetual." The present calendar, despite the device of leap year, gets off the beat, so to speak. The proposed calendar would not do that.

Catholic Consideration

London Universe

Provision for a fixed Easter has been made in this country by the Act of 1928, but its operation is deferred pending the consent of the religious bodies. As regards the Catholic Church, Abbot Cabrol obtained the sympathetic consideration of the Holy Father and of Cardinal Pacelli; but it is known that the Holy See will not move at all in the matter without the gravest deliberation, and certainly not just at present. But the question is now clearly open to discussion among Catholics, and to advocacy, if they choose, in due submission to authority. There is no dogmatic objection to calendar reform or to the fixation of Easter; these are matters of ecclesiastical order, which the Church can dispose according to her judgment.

It may be remembered that some months ago (April 16, to be precise) we wrote about the movement for calendar reform, and the support it had gained in influential Catholic circles throughout the world. There have been various schemes for reform, some of them very drastic, but all the practical ends sought by reformers seem to be secured by The World Calendar scheme.

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SEVERAL suggestions have been made regarding possible dates to be considered for the adoption of The World Calendar, now that it appears impossible to secure international agreement by January 1, 1939. It is urged that the new goal might well be December 31, 1939, or December 31, 1944.

On either of these dates, the following procedure might well be adopted: Push back the new calendar by one weekday, so as to make January 1 (which would ordinarily fall on Monday) come on Sunday. The previous day, December 31, would be considered as an extra or double Saturday, exactly like the December Y of The World Calendar.

Among world astronomical and mathematical authorities, this procedure seems to have a wide approval. Dr. Robert G. Aitken of Lick Observatory writes: "My personal viewpoint is that there is no objection of any kind to doing this. Whether the change is made at the end of 1939 or 1944, there will be no effect upon the date of beginning of Spring. The date of the vernal equinox, in Greenwich civil time, is now sometimes March 20, more often March 21. If The World Calendar introduces any change at all, it will not exceed a day, and that cannot possibly affect the relations of the calendar to our seasons."

From the U. S. Naval Observatory in Washington comes the following comment: "The new calendar can go into effect on any day of the last four months of 1939 or 1944 with exactly the same results . . . The proposal submitted is correct—that Sunday, December 31, in either 1939 or 1944 be made an *exceptional day*, that is, outside of the week, and to be considered as an extra Saturday. Doctor Robertson suggests that it be called *Year-End Day*, to show that it still is in the same year. In that way no day will be dropped and no year changed in length."

The World Calendar Association will be glad to receive further comments regarding the feasibility of this plan for a new date upon which calendar reform could be conveniently adopted by the nations of the world.

FROM THE MAIL BAG

I am thoroughly committed to the idea of calendar reform.—Ray Stannard Baker, Amherst, Mass.

It ought to be a matter for the Lambeth Conference to decide.—Rt. Rev. H. J. Mikell, Bishop of Atlanta.

Very much interested in the problem and shall do all in my power to facilitate the change from our old calendar to The World Calendar. The new 12-month calendar with four equal quarters would prove a great boon in planning an educational calendar year.—I. J. Lubbers, Pres., Central College, Pella, Iowa.

The work you are doing is one that will make every thinking person take note of our rapidly changing civilization and the complexities that come with it.—E. F. Northrop, Eugene, Ore.

May I avail myself of this opportunity to assure you that you will have my full support to the calendar reform movement.—Li Shu-tien, President, Pei-Yang University, Tientsin, China.

Calendar reform greatly needed: Your publication is doing a massive good work of world enlightenment.—Rev. D. M. Brown, Vawter, Minn.

I do feel that some modification of the present calendar is badly needed.—C. E. Brewer, Pres., Meredith College, Raleigh, N. C.

The four equal quarters is the best plan I have seen.—Sir Charles V. Boys FRS, St. Marybourne, Andover, England.

Permit me to compliment you on the progress you have achieved in calendar reform. This has required long, persistent and intelligent effort which now seems fairly sure of complete success.—J. F. Stone, Columbus, O.

Thank you for the pamphlet on Calendar Reform. The importance of getting this into the thinking of youth is wisely recognized. And how much confusion could be avoided by regulating the calendar on fixed and scientific principles.—L. C. Wright, Pres., Baldwin-Wallace College, Berea, O.

I firmly believe such a reform would be advisable.—M. F. Smith, U. S. Congressman from Washington.

The World Calendar is excellent and very desirable.—Jos. de Gruyter, Soesterberg, Holland.

I have been very much interested in studying the contents published in the *Journal of Calendar Reform*, and have passed the publication on to members of our organization.—R. R. Choate, Appalachian Electric Power Co., Roanoke, Va.

All of us are interested in the revision of the calendar. Personally I would like to see it go into effect.—Harry S. Truman, U. S. Senator from Missouri.

The contents of the pamphlet you forwarded me constitute a very telling argument in favor of the change proposed.—W. E. Hotchkiss, Pres., Armour Inst. of Technology, Chicago.

As a long-time member of the Association, and a great believer in The World Calendar, I have tried to interest many friends and have yet to meet anyone opposed to it, once it was explained to them.—J. F. Simonson, Treas., Bank of Rockville Centre, N. Y.

Long ago I expressed myself as favoring the proposed calendar reform. It is my impression, however, that calendar reform will come as the result of a recommendation from specialists rather than as an effect of popular demand.—F. B. Robinson, Pres., College City of New York.

The subject rather intrigues me.—J. B. Clark, U. S. Congressman from North Carolina.

For many years, I have been interested in some form of calendar reform and have watched with considerable interest the headway that has been made in influencing public opinion along these lines.—W. H. Cramblet, Pres., Bethany College, Bethany, W. Va.

I will have the copies of your Journal placed on board the ships of a line with which I am associated.—C. Millman Ashton, Sydney, Australia.

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EDITORIAL PARAGRAPHS

Need for a reform of the calendar, for which the London Chamber of Commerce has consistently pressed for many years, is particularly exemplified in 1937 which discloses rather more than the customary number of absurdities. It will be remembered that the Council of the London Chamber at their meeting in April, 1936, unanimously adopted a resolution pointing out the inefficiency of the present system for comparative statistical purposes and favoring a scheme for a 12-months perpetual calendar so as to insure that any given day of any given month would always fall on the same date and that the same quarter in each year would contain the same number of working days.—London Chamber of Commerce *Journal*.

A child growing up in the modern world takes it for granted that the days, weeks, months and years have always been as they now are. What is, seems to be the natural and right thing. Unfortunately this applies to other things besides calendars, and people suffer long under onerous social conditions which could readily be changed if they were not wedded to the vicious conditions under which they grew up and which seem natural to them. The fact is that there have been many changes in the measurement of time.—Milwaukee *Leader*.

While Canada is, unfortunately, still officially tied to the 13-month idea (Yugoslavia being the only other country), public sentiment in favor of the 12-month equal-quarter calendar has been worked up by the Rational Calendar Association, which has been active for the past four years and already has a large membership. The association is an Empire branch of the British organization of the same name.—Orillia (Ontario) *Packet and Times*.

In a quantity production era, and in an integrated, highly interdependent economy we must keep accounts. And when the keepers of those big accounts—scientists, government clerks, and business agents unite in asking, as a measure of common sense, that a 354-year-old time scale be modernized to produce better statistical results, tradition alone will scarce-

ly stand in the way. The idea of a new and permanent calendar is no longer fancifully improbable.—Pontiac (Michigan) *Press*.

All the way from Mandalay to Geneva there's talk about calendar reform.—Mission (Texas) *Enterprise*.

A revised calendar would be an improvement, and the people would readily get used to it, and it may come in the near future, as several governments are giving it serious consideration.—St. Cloud, (Minnesota) *Times-Journal*.

Business leaders throughout the country and Church authorities are supporting Lord Desborough in his campaign.—Manchester (England) *Sunday Chronicle*.

It is universally conceded that our present calendar, with months ranging from 28 to 31 days in length, presents certain disadvantages because of that lack of uniformity.—Lake Placid *News*.

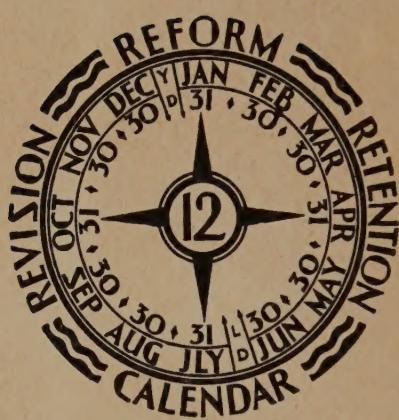
For many years there has been a growing demand throughout the world among statesmen, scientists, high church officials and business men for a final adjustment of the calendar.—Boston *Argus-Advocate*.

One of the striking advantages of the suggested calendar, considered merely as a time-recording device, is that all years would conform to the same schedule.—Greenock (England) *Telegram*.

The last change was in the eighteenth century when the Gregorian calendar was accepted in the United States and other nations. But the Gregorian calendar did not quite succeed in accomplishing its purposes.—Detroit *Legal Courier*.

Many movements for calendar reform have received consideration throughout the world, strictly on their merits. The World Calendar has met all the tests, and seems in a fair way to gain approval.—Minneapolis *Progress-Register*.

Most people agree that the present uneven, irregular calendar interferes considerably with an even and scientific conduct of business. An even, orderly calendar would add much to the general good.—Union City (N. J.) *Hudson Dispatch*.



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